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UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,003,707, Re. S.N. 403,121, Filed July 29, 1982, Cl. 23/232R, METHOD AND ARRANGEMENT FOR MEASURING THE CONCENTRATION OF GASES, Dietrich W. Lubbers, et al., Owner of Record: *Max-Planck-Gesellschaft, Munchen, Germany,* Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 177

4,160,863, Re. S.N. 445,398, Filed Nov. 30, 1982, Cl. 544/30, PROCESS FOR THE PREPARATION OF THE CRYSTALLINE MONOHYDRATE OF 7-(D-ALPHA-AMINO-ALPHA-(P-HYDROXYPHENYL)-ACET-AMIDO)-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACID, Daniel Bouzard, et al., Owner of Record: *Bristol-Myers, Co., New York, N.Y.,* Attorney or Agent: Robert E. Carnahan, et al., Ex. Gp.: 122

4,226,174, Re. S.N. 419,374, Filed Sept. 17, 1982, Cl. 98/104, HUMIDIFIER, James E. Vesper, Owner of Record: *Inventor,* Attorney or Agent: Robert V. Sloan, Ex. Gp.: 344

4,235,524, Re. S.N. 443,659, Filed June 29, 1979, Cl. 350/299, REFLECTIVE APPARATUS, George Lechter, et al., Owner of Record: *Rorrim, Inc., Cambridge, Mass.,* Attorney or Agent: Louis H. Reens, et al., Ex. Gp.: 257

4,250,629, Re. S.N. 443,539, Filed Nov. 22, 1982, Cl. 34/13.8, LUMBER CONDITIONING KILN, Donald C. Lewis, Owner of Record: *Inventor,* Attorney or Agent: Sewall P. Bronstein, et al., Ex. Gp.: 344

4,255,459, Re. S.N. 444,380, Filed Nov. 26, 1982, Cl. 426/521, BLANCHING, PASTEURIZING AND STERILIZING PROCESS AND APPARATUS SUITABLE THEREFOR, Donald H. G. Glen, Owner of Record: *Inventor,* Attorney or Agent: Harold D. Steinberg, et al., Ex. Gp.: 172

4,269,204, Re. S.N. 445,771, Filed Nov. 30, 1982, Cl. 131/341, CIGARETTE FILTER, Takeyoshi Yamaguchi, Owner of Record: *Inventor,* Attorney or Agent: Harold I. Kaplan, et al., Ex. Gp.: 335

4,302,104, Re. S.N. 443,381, Filed Nov. 22, 1982, Cl. 356/152, VEHICLE WHEEL ALIGNMENT APPARATUS, Lee Hunter, et al., Owner of Record: *Inventors,* Attorney or Agent: Frederick M. Woodruff, Ex. Gp.: 222

4,303,086, Re. S.N. 439,281, Filed Nov. 4, 1982, Cl. 132/73.6 PORTABLE MULTI-FUNCTION APPARATUS, Cheng Chung Wang, Owner of Record: *Inventor,* Attorney or Agent: Richard P. Berg, et al., Ex. Gp.: 336

4,303,437, Re. S.N. 445,935, Filed Dec. 1, 1982, Cl. 65/99, PROCESS FOR THE ADJUSTMENT OF THE GLASS TEMPERATURE IN A FLOAT GLASS LEHR IN ORDER TO BRING THIS PROCESS INTO OPERATION, Jean P. Garcelon, Owner of Record: *Stein Surface, Orangis, France,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 173

4,306,562, Re. S.N. 443,321, Filed Nov. 22, 1982, Cl. 128/348, TEAR APART CANNULA, Thomas A. Osborne, Owner of Record: *Cook, Inc., Bloomington, Ind.,* Attorney or Agent: Harold R. Woodard, et al., Ex. Gp.: 335

4,306,624, Re. S.N. 442,913, Filed Nov. 19, 1982, Cl. 198/341, CONVEYOR APPARATUS, Antonio Magni, Owner of Record: *Axis, S.p.A., Firenze, Italy,* Attorney or Agent: Lawrence I. Lerner, Ex. Gp.: 313

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,654,638 Reexam. No. 90/000,316, Requested: Jan. 14, 1983, Cl. 4/144.1, OUTPUT COMMODE PAN, Alice W. Nye, Owner of Record: *Inventor,* Attorney or Agent: John D. Norris, Ex. Gp.: 243, Requester: Alice W. Nye, Missouri City, Tex.

4,017,170, Reexam. No. 90/000,315, Requested: Jan. 13, 1983, Cl. 355/3R, ELECTROPHOTOGRAPHIC DEVICE, Shigehiro Komori, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or

Agent: Fitzpatrick, Cella, et al., Ex. Gp.: 210, Requester: Norman E. Lehrer, Haddonfield, N.J.

4,128,357, Reexam. No. 90/000,313, Requested: Jan. 12, 1983, Cl. 404/41, SLAB-ELEMENTS FOR COVERING THE GROUND, Gunter Barth, et al., Owner of Record: *F. Von Langsdoff Bauverfahren GmbH, Rastatt, W. Germany,* Attorney or Agent: St. Onge, Steward, et al., Ex. Gp.: 350, Requester: Russell D. Orkin, Pittsburgh, Pa.

4,275,822, Reexam. No. 90/000,314, Requested: Jan. 12, 1983, Cl. 222/63, APPARATUS FOR METERING AT LEAST TWO REACTION COMPONENTS INTO A MIXING CHAMBER, Richard Juffa, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 311, Requester: Richard A. Elder, Mobay Chemical Corp., Pittsburgh, Pa.

Current Membership of Performance Review Board

This notice announces the current membership of the Performance Review Board for the Patent and Trademark Office. Since the last announcement of the membership in the Federal Register of Mar. 8, 1982 (47 FR 9878), two of the members have left the agency and two new members have been appointed. The former members who have left the agency are:

Richard J. Shakman
Assistant Commissioner for Administration
U.S. Patent and Trademark Office
Washington, D.C. 20231

Herbert C. Wamsley
Director, Trademark Examining Operation
U.S. Patent and Trademark Office
Washington, D.C. 20231

The two new members are:

Samih N. Zaharna
Director, Patent Examining Group 160
U.S. Patent and Trademark Office
Washington, D.C. 20231

Samuel S. Matthews
Director, Patent Examining Group 250
U.S. Patent and Trademark Office
Washington, D.C. 20231

Each new member is appointed to serve for a term of three years to expire on Jan. 31, 1986.

The following member's term will expire on January 31, 1983:

James O. Thomas, Jr., Member, Director
Patent Examining Group 140, U.S.
Patent and Trademark Office,
Washington, D.C. 20231.

The membership of the PRB on Feb. 1, 1983, will be as follows:

Donald J. Quigg, Chairman, Deputy Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term-permanent.

Rene D. Tegtmeyer, Member, Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term-permanent.

Margaret M. Laurence, Member, Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term-permanent.

Bradford R. Huther, Member, Assistant Commissioner for Finance and Planning, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term-permanent.

Samuel S. Matthews, Member, Director, Examining Group 250, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term-expires Jan. 31, 1986.

Richard J. Wieland, (Outside) Member, Assistant General Counsel for Litigation, HQ National Aeronautics and Space Administration, Washington, D.C. 20546 Term-expires July 12, 1984

Samih N. Zaharna, Member, Director, Patent Examining Group 160 U.S. Patent and Trademark Office Washington, D.C. 20231. Term-expires Jan. 31, 1986.

Persons desiring any further information about the membership of the PRB may contact Mr. Aaron W. Deitch, Personnel Officer, U.S. Patent and Trademark Office, Washington, D.C. 20231. Telephone (703) 557-2662.

Jan. 21, 1983. DONALD J. QUIGG,
Deputy Commissioner of Patents and Trademarks.

Requirement for Filing of Verified Statements Claiming Small Entity Status

The purpose of this notice is to supplement the notice published Oct. 26, 1982 at 1023 O.G. 77, entitled "Filing of Verified Statements Claiming Small Entity Status" and to extend the practice contained therein beyond Feb. 27, 1983, pending consideration by the Patent and Trademark Office of the feasibility of implementing via the rulemaking process, a practice similar to that set forth in the notice.

The notice published Oct. 26, 1982 provides in part, that any verified statement claiming small entity status will be accepted as timely filed if (1) the first fee in a patent application has been paid on or after Oct. 1, 1982, but before Feb. 27, 1983, in the amount established for a non-small entity and (2) such verified statement is filed within three months of the date of payment of the first fee. The practice is hereby extended to a first fee paid after Feb. 27, 1983. Until further notice, if a verified statement is filed within three months of the date of payment of the first fee paid after Feb. 27, 1983, the statement will be treated as though it were present on the date the fee was paid. The correct amount of the fee will be determined and any excess will be refunded upon request.

Request for refunds, along with the verified statements, should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Refund Section, Accounting Division, Office of Finance. Such requests should refer to this notice.

The practice presently in effect is hereby extended until further notice. The extension will provide applicants additional time pursuant to this notice and provide the Office the time to consider the feasibility of a possible rule change.

Jan. 20, 1983. DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Section 7(c) of the Lanham Act

It has come to the attention of the Patent and Trademark Office that many registrants are requesting new certificates pursuant to Section 7(c) of the Lanham Act when they would prefer certified copies, showing title, of their registrations. Section 7(c) provides for the issu-

ance of a new certificate to the assignee of record of a registration. This document contains only the registration number and name and address of the new owner, and is attached to the original certificate of registration. It is not a substitute certificate, and does not have the necessary information to stand on its own. The cost is $100.00.

As an alternative, the registrant may order a certified copy of its registration which shows title. This document is available for $6.50. It is a reproduction of the original certificate of registration, with an additional notation indicating the current record owner. As set forth in Section 7(e), a certified copy shall be evidence in all cases where the original would be evidence.

MARGARET M. LAURENCE,
Jan. 18, 1983. *Assistant Commissioner for Trademarks.*

Government-Owned Inventions

Available for Licensing

The inventions listed below are assigned to the United States Government as represented by the Secretary of the Navy and are made available for licensing by the Department of the Navy.

For further information contact:

Dr. A. C. Williams
Staff Patent Adviser
Office of Naval Research (Code 305)
800 North Quincy Street
Arlington, Va. 22217
Telephone No. 202–696–4005

U.S. DEPARTMENT OF THE NAVY
Director, Navy Patent Program/
Patent Counsel for the Navy
Office of Naval Research
Code 302
Arlington, Va. 22217

Patent application 86,859. Electrical Fire Fighting Simulator. Filed Oct. 22, 1979.

Patent application 138,013. Ellipticized Acoustical Lens Providing Balanced Astigmatism. Filed Apr. 7, 1980.

Patent application 182,367. Heat Driven Heat Pump Using Paired Ammoniated Salts. Filed Aug. 29, 1980.

Patent application 210,902. Interferometrically Tuned Laser Resonator. Filed Nov. 28, 1980.

Patent application 238,334. Thrust Shaft Seal. Filed Feb. 26, 1981.

Patent application 257,289. Pzt Composite and a Fabrication Method Thereof. Filed Apr. 24, 1981.

Patent application 258,128. Deepwater Propellant Embedded Anchor Having Emergency Release Mechanism. Filed Apr. 27, 1981.

Patent application 262,581. Integral/Low Voltage Control for Miniature Impact Tool. Filed May 11, 1981.

Patent application 263,821. Plated Bridge Step-Over Connection for Monolithic Devices and Method for Making Thereof. Filed May 15, 1981.

Patent application 267,168. Wide Swath Precision Echo Sounds. Filed May 26, 1981.

Patent application 271,781. Nonwavelength-Limited Holographic Sound Field Reconstruction. Filed June 9, 1981.

Patent application 275,547. Monolithic Indium Phosphide Integrated Logic Circuit Technology. Filed June 19, 1981.

Patent application 276.224. Field Effect Transistor Circuit for Modulator and Demodulator Applications. Filed June 22, 1981.

Patent application 276,439. Multiplexed Mos Multiaccess Memory System. Filed June 22, 1981.

Patent application 277,447. Gain-Step Companding Analog to Digital Converter. Filed June 25, 1981.

Patent application 277,448. Acoustic Degenerate Four-Wave Mixing Phase-Conjugate Reflector. Filed June 25, 1981.

Patent application 282,357. Programmable Crt Brightness Control. Filed July 13, 1981.

Patent application 284,848. Method for Forming Y-Boron. Filed July 20, 1981.

Patent application 285,661. Inductive Intense Beam Source. Filed July 21, 1981.

Patent application 294,263. Shaft Mountable Fm Transmission Torque Meter. Filed Aug. 19, 1981.

Patent application 295,175. Hybrid Fuze Triggering Device. Filed Aug. 21, 1981.

Patent application 295,891. Phthalonitriles Resins and Preparation Thereof. Filed Aug. 24, 1981.

Patent application 295,915. Phenolic-Cured Phthalonitrile Resins. Filed Aug. 24, 1981.

Patent application 296,402. System for Recording Waveforms Using Spatial Dispersion. Filed Aug. 26, 1981.

Patent application 302,346. Output for Laser Resonator. Filed Sept. 15, 1981.

Patent application 303,339. Amorphous Alloy Toroids. Filed Sept. 18, 1981.

Patent application 303,758. Ellipticized Rubber Acoustical Lens Providing Balanced Astigmatism. Filed Sept. 21, 1981.

Patent application 303,802. Protective Cover for Aircraft Having Conical Radomes. Filed Sept. 21, 1981.

Patent application 307,923. Linear Frequency Sweep Generator for Continuous Transmission Fm Sonar. Filed Oct. 2, 1981.

Patent application 308,309. Flotation Device. Filed Oct. 5, 1981.

Patent application 310,193. Method for Bonding Materials to Cured Silicone Rubber Insulation. Filed Oct. 9, 1981.

Patent application 310,938. Light-Induced Unidirectional Light Amplifier. Filed Oct. 13, 1981.

Patent application 310,939. Light-Induced Unidirectional Light Switch. Filed Oct. 13, 1981.

Patent application 314,334. Self-Shoring Adhesive System. Filed Oct. 23, 1981.

Patent application 314,616. Aircraft Weight and Center of Gravity Cockpit Readout System. Filed Oct. 26, 1981.

Patent application 315,327. Electrical Poly Y-Phase Nylon 11. Filed Oct. 26, 1981.

Patent application 322,328. Heat Measuring Device. Filed Nov. 18, 1981.

Patent application 325,419. Method for Making Radially Compliant Line Array Hose. Filed Nov. 27, 1981.

Patent application 326,303. Small Diameter, Low Frequency Multimode Hydrophone. Filed Nov. 30, 1981.

Patent application 326,872. Launch Mechanism. Filed Dec. 3, 1981.

Patent application 332,701. New Polymers as Carriers for Transition Metals. Filed Dec. 21, 1981.

Patent application 333,157. Repairable Backshell Adapter for Electrical Connector. Filed Dec. 21, 1981.

Patent application 333,607. Retainer for a Projectile Rotating Band. Filed Dec. 23, 1981.

Patent application 334,101. A Tangential Drag Enhancing Yarn. Filed Dec. 24, 1981.

Patent application 335,903. Undersea, High Pressure Bulkhead Penetrator for Use with Fiber Optic Cables. Filed Dec. 30, 1981.

Patent application 337,893. Synthesis and Polymerization of Phthalonitrile Monomers Containing Multiple Phenoxy and Sulfone Linkages. Filed Jan. 7, 1982.

Patent application 338,396. Digital Coherent Detector. Filed Jan. 11, 1982.

Patent application 339,922. Continuous Poling Technique for Pzt Fibers. Filed Jan. 18, 1982.

Patent application 339,970. Flicker Free Stretched Grams. Filed Jan. 15, 1982.

Patent application 340,679. Thermal Insulated Duct Support. Filed Jan. 19, 1982.

Patent application 340,944. Composition for Removing Metal Oxides from Surfaces. Filed Jan. 20, 1982.

Patent application 343,682. Articulated Light Guide. Filed Jan. 28, 1982.

Patent application 343,810. Nitropolyformals. Filed Jan. 29, 1982.

Patent application 344,098. Broad Bandwidth Composite Transducers. Filed Jan. 29, 1982.

Patent application 344,417. Low Loss Buoyant Coaxial Cable. Filed Feb. 1, 1982.

Patent application 344,916. A Four Pivot Linkage to Simulate Head/Neck Kinematics. Filed Feb. 2, 1982.

Patent application 347,219. A Compact Wideband Transmitting Antenna. Filed Feb. 9, 1982.

Patent application 347,676. Angle of Arrival Measurements for Two Unresolved Sources. Filed Feb. 10, 1982.

Patent application 349,134. Synthesis of a New Explosive Compound, Trans-1,4,5,8-Tetranitro-1,4,5,8-Tetraazadecalin. Filed Feb. 16, 1982.

Patent application 350,919. Isolation Steam Valve with Atmospheric Vent and Relief Capability. Filed Feb. 22, 1982.

Patent application 350,920. Armament Shorting Arrangement. Filed Feb. 22, 1982.

Patent application 351,059. Repellent Coatings for Optical Surfaces. Filed Feb. 22, 1982.

Patent application 351,711. Piperazine Derivatives of Ferrocene: Potential Solid Propellant Burning Rate Modifiers. Filed Feb. 24, 1982.

Patent application 351,831. A Coaxial Wave-Guide Commutator Feed for a Scanning Circular Phased Array Antenna. Filed Feb. 24, 1982.

Patent application 352,448. Foam Filled Muzzle Blast Reducing Device. Filed Feb. 25, 1982.

Patent application 353,295. Additives Which Prevent Gassing of Energetic Binder Containing Propellants. Filed Mar. 1, 1982.

Patent application 353,682. Target for Optically Activated Seekers and Trackers. Filed Mar. 1, 1982.

Patent application 353,787. Composite Round/Rapid Fire Gun. Filed Mar. 1, 1982.

Patent application 355,400. Simulator Interface System. Filed Mar. 8, 1982.

Patent application 355,831. Thin Film Microstrip Circuits. Filed Mar. 8, 1982.

Patent application 355,952. Amplitude Mode Acoustic Sensors. Filed Mar. 8, 1982.

Patent application 356,552. Hydraulic Aircraft/Stores Cartridge. Filed Mar. 9, 1982.

Patent application 356,590. Optical Rotation-Sensing Interferometer with (3X3)-(2X2) Directional Coupler. Filed Mar. 9, 1982.

Patent application 356,863. Method of Preparing and Lasing Laserable Color Centers Crystals. Filed Mar. 10, 1982.

Patent application 358,940. Fabrication of Schottky Barrier Diodes on $PBCl_2$-$PbS_{.5}Se_{.5}$Epitaxial Films. Filed Mar. 17, 1982.

Patent application 358,941. Sensitized Epitaxial Infrared Detector. Filed Mar. 17, 1982.

Patent application 360,524. Ground Fault Detector and Shut-Down System. Filed Mar. 22, 1982.

Patent application 361,330. Electronic Plug-In Module Extractor. Filed Mar. 25, 1982.

Patent application 361,713. Water Jet Sediment Probe. Filed Mar. 25, 1982.

Patent application 362,004. Ellipticized Acoustical Liquid Lens Providing Balanced Astigmatism. Filed Mar. 25, 1982.

Patent application 362,354. Heater for Ultra High Pressure Compressed Gas. Filed Mar. 26, 1982.

Patent application 362,355. Expander Stroke Delay Mechanism for Split Stirling Cryogenic Cooler. Filed Mar. 26, 1982.

Patent application 362,829. Field of View Test Apparatus. Filed Mar. 29, 1982.

Patent application 363,349. Aircraft Loading Adapter for Use with Ordnance Lift Vehicle. Filed Mar. 29, 1982.

Patent application 364,062. A Pyrolysis-Mass Spectrometry Approach to Organic Marine Chemistry Using Chemical Ionization. Filed Mar. 31, 1982.

Patent application 364,098. Calibration Method for Acoustic Scattering Measurements Using a Spherical Target. Filed Mar. 31, 1982.

Patent application 365,845. A Generalized Drifting Oceanographic Sensor. Filed Apr. 5, 1982.

Patent application 365,857. A Handprinted Symbol Recognition System. Filed Apr. 5, 1982.

Patent application 366,954. Method of Recovering a Copolymer. Filed Apr. 9, 1982.

Patent application 368,933. Controlled Gas Generator System. Filed Apr. 16, 1982.

Patent application 369,377. Range Clearance by Enhancing Oxidation of Ferrous Ordnance In-Situ. Filed Apr. 19, 1982.

Patent application 370,309. A Capstan Adaptable "V" Puller. Filed Apr. 21, 1982.

Patent application 370,310. A Split-Bus Multiprocessor System. Filed Apr. 21, 1982.

Patent application 370,755. Fiber Optic Gyroscope with Alternating Output Signal. Filed Apr. 22, 1982.

Patent application 371,142. Instantaneous Start and Stop Gas Generator. Filed Apr. 23, 1982.

Patent application 371,706. Interfering Noise Pulse Eliminator and Its Use. Filed Apr. 26, 1982.

Patent application 371,869. High Density, Low Viscosity AirBreather Fuel (R.J.-4-I). Filed Apr. 26, 1982.

Patent application 373,080. Low Viscosity Air Breathing Missile Fuel. Filed Apr. 29, 1982.

Patent application 373,082. An Arcing Fault Detector. Filed Apr. 29, 1982.

Patent application 373,305. Tolerancing Device. Filed Apr. 29, 1982.

Patent application 373,756. Fluorescence Quenching Technique for Scanning Visual Systems. Filed Apr. 30, 1982.

Patent application 374,207. Conformal Array Compensation Beanformer. Filed May 3, 1982.

Patent application 374,575. Helmet Mounted Display Projector. Filed May 3, 1982.

Patent application 374,760. Leak Detector. Filed May 3, 1982.

Patent application 375,797. Small Arms Firing Effects Simulator. Filed May 8, 1982.

Patent application 376,474. Digital Compass Having a Ratiometric Bearing Processor. Filed May 10, 1982.

Patent application 377,106. P1 Polyphase Code Expander-Compressor. Filed May 11, 1982.

Patent application 377,107. Phase Coded Pulse Expander-Compressor. Filed May 11, 1982.

Patent application 377,108. P2 Polyphase Code Expander-Compressor. Filed May 11, 1982.

Patent application 377,119. Synthesis of the Isomeric Aminotetranitrotoluenes. Filed May 11, 1982.

Patent application 377,240. Isometric Grip Bending Beam Control. Filed May 12, 1982.

Patent application 378,161. Two Layer Hydraulic Analogy for Testing Supersonic Gas Flows with Shock Waves. Filed May 14, 1982.

Patent application 378,167. An Improved Synthesis of 3-Hydrooxyoxetane. Filed May 14, 1982.

Patent application 379,685. Tactical Expendable Device. Filed May 19, 1982.

Patent application 380,171. Fresnel Lens in an Improved Infinity Image Display System. Filed May 20, 1982.

Patent application 381,099. Lithium-6 Wire Mesh Neutron Detector. Filed May 24, 1982.

Patent application 381,829. Four Bar Manifold. Filed May 24, 1982.

Patent application 382,850. Phase-Lock Fiber Optic Interferometer. Filed May 27, 1982.

Patent application 383,034. High Speed Sample and Hold Circuit. Filed May 28, 1982.

Patent application 383,421. An Improved Preparation of Bis (Axidomethyl) Oxetane. Filed June 1, 1982.

Patent application 383,867. Atmospheric Transmissometer. Filed June 1, 1982.

Patent application 383,918. Vmos-Fet Impatt Diode Pulse Bias Circuit. Filed June 1, 1982.

Patent application 385,739. Three-Mirror Active-Passive Semiconductor Laser. Filed June 7, 1982.

Patent application 386,154. Lightweight Neutron Detector. Filed June 7, 1982.

Patent application 386,465. Solid State Hydrogen Pumping and Storage Material. Filed June 9, 1982.

Patent application 386,828. Orthogonalizer for Inphase I and Quadrature Digital Data. Filed June 9, 1982.

Patent application 386,838. Real-Data Digital-Real-Weight Canceller. Filed June 9, 1982.

Patent application 388,049. Synthesis and Polymerization of 3-Axidooxetane. Filed June 14, 1982.

Patent application 388,563. Dual-Band, Low Sidelobe, High Efficiency Mirror Antenna. Filed June 15, 1982.

Patent application 389,132. Wide-Band Distributed RF Coupler. Filed June 15, 1982.

Patent application 389,139. Low Sidelobe, High Efficiency Mirror Antenna. Filed June 15, 1982.

Patent application 389,521. An Automatic Strobe/Camera Control Unit. Filed June 17, 1982.

Patent application 390,096. Vector Summation Power Amplifier. Filed June 21, 1982.

Patent application 391,191. Oxygen Breathing Apparatus Simulator. Filed June 23, 1982.

Patent application 391,900. Overboarding Fixture. Filed June 25, 1982.

Patent application 391,901. New Plasticizer for Nitropolymers. Filed June 25, 1982.

Patent application 391,902. Improved Process for the Preparation of Dimenthylmethylenedinitramine. Filed June 25, 1982.

Patent application 392,185. Fiber Optics Image Scope (Microendoscope), Ureteroscope. Filed June 28, 1982.

Patent application 392,813. Method for Measuring Material Characteristics. Filed June 28, 1982.

Patent application 393,246. Directional Line-Hydrophone Array Calibrator. Filed June 29, 1982.

Patent application 393,972. Fiber Optic Spectrophone. Filed June 30, 1982.

Patent application 394,084. Improved Method for the Preparation of Methylnitramine. Filed July 1, 1982.

Patent application 394,218. Improved Synthesis of Dimethylmethylene Dintramine. Filed July 1, 1982.

Patent application 394,975. Munroe Effect Breaching Device. Filed July 2, 1982.

Patent application 395,431. Polarimetric Image Recorder. Filed July 6, 1982.

Patent application 398,499. Two Headed Magnetic Proximity Sensor. Filed July 15, 1982.

Patent application 398,827. Fluorine Implantation of Polyactetylene and Graphite. Filed July 18, 1982.

Patent application 399,512. A Sea Floor Penetraometer. Filed July 19, 1982.

Patent application 399,519. Dual Sense, Circularly Polarized Helical Antenna. Filed July 19, 1982.

Patent application 401,277. Ultra-Fast Field Emitter Array Vacuum Integrated Circuit Switching. Filed July 23, 1982.

Patent application 402,403. High Resolution Defraction Grating. Filed July 27, 1982.

Patent application 403,837. Fiber Optic Spectrophone for Remote Sensing. Filed July 30, 1982.

Patent application 403,838. Thermovoltaic Power Source. Filed July 30, 1982.

Patent application 405,465. The Modified Betatron Accelerator. Filed Aug. 5, 1982.

Patent application 406,427. Fiber Optic Magnetic Field Sensor. Filed Aug. 9, 1982.

Patent application 411,777. Single Handed Set-Up Apparatus. Filed Aug. 26, 1982.

Patent application 417,740. Underwater Splice for Submarine Coaxial Cable. Filed Sept. 13, 1982.

Patent application 420,451. Panoramic Lens. Filed Sept. 20, 1982.

Patent 3,382,678. Gas Turbine Cycle Providing a High Pressure Efflux. Filed July 12, 1966. Patented May 14, 1968.

Patent 3,434,551. Buoyant Coring Apparatus. Filed June 26, 1967. Patented Mar. 25, 1969.

Patent 3,993,577. Method for Production of Heat and Hydrogen Gas. Filed Dec. 8, 1975. Patented Nov. 23, 1976.

Patent 4,232,313. Tactical Navigation and Communication System. Filed Sept. 22, 1972. Patented Nov. 4, 1980.

Patent 4,248,854. Production of Antibodies Toward Asbestos and Immunoassay Therewith. Filed Aug. 27, 1979. Patented Feb. 3, 1981.

Patent 4,264,362. Supercorroding Galvanic Cell Alloys for Generation of Heat and Gas. Filed Aug. 13, 1979. Patented Apr. 28, 1981.

Patent 4,279,969. Method of Forming Thin Niobium Carbonitride Superconducting Films of Exceptional Purity. Filed Feb. 20, 1980. Patented July 21, 1981.

Patent 4,284,617. Solid Compositions for Generating Fluorine and Gaseous Fluorine Compounds. Filed Nov. 30, 1979. Patented Aug. 18, 1981.

Patent 4,284,747. Cis-Trans Fluoropolyol Polyacrylate. Filed Feb. 25, 1980. Patented Aug. 18, 1981.

Patent 4,286,212. Variable Signal Generator for Galvanometer Exhibiting Hysteresis. Filed Sept. 8, 1978. Patented Aug. 25, 1981.

Patent 4,293,339. Underwater Wax Formulation and Method. Filed Feb. 28, 1980. Patented Oct. 6, 1981.

Patent 4,295,604. Automatic Temperature Control System for Diver Heating System. Filed Apr. 24, 1980. Patented Oct. 20, 1981.

Patent 4,295,989. Luminescent Hafnia Composition. Filed June 23, 1980. Patented Oct. 20, 1981.

Patent 4,299,431. Underwater-Mateable Electrical Connector. Filed Mar. 3, 1980. Patented Nov. 10, 1981.

Patent 4,304,613. Mini Base Alloy Shape Memory Enhancement Through Thermal and Mechanical Processing. Filed May 12, 1980. Patented Dec. 8, 1981.

Patent 4,304,870. Ablative-Resistant Dielectric Ceramic Articles. Filed Feb. 20, 1980. Patented Dec. 8, 1981.

Patent 4,304,896. Polyphthalocyanine Resins. Filed Aug. 19, 1980. Patented Dec. 8, 1981.

Patent 4,305,073. Radar Video Compression System. Filed Jan. 30, 1980. Patented Dec. 3, 1981.

Patent 4,305,998. Protective Coating. Filed Feb. 4, 1980. Patented Dec. 15, 1981.

Patent 4,306,413. Hydraulic Power and Control System. Filed June 30, 1975. Patented Dec. 22, 1981.

Patent 4,306,512. Homing Torpedo System. Filed Aug. 13, 1964. Patented Dec. 22, 1981.

Patent 4,306,552. Plasticized Poly-e-Caprolactone. Filed Aug. 12, 1980. Patented Dec. 22, 1981.

Patent 4,306,783. Scattered-Light Imaging System. Filed Feb. 27, 1980. Patented Dec. 22, 1981.

Patent 4,307,035. Method of Synthesizing Resin Prepolymers. Filed Aug. 5, 1980. Patented Dec. 22, 1981.

Patent 4,307,507. Method of Manufacturing a Field-Emission Cathode Structure. Filed Sept. 10, 1980. Patented Dec. 29, 1981.

Patent 4,308,603. Ferrofluid Transducer. Filed Sept. 4, 1980. Patented Dec. 29, 1981.

Patent 4,308,753. Low-Power Electromagnetic Flow-Meter. Filed Dec. 3, 1979. Patented Jan. 5, 1982.

Patent 4,309,109. Pulsed Interferometric Remote Gauge. Filed May 25, 1972. Patented Jan. 5, 1982.

Patent 4,309,773. Apparatus and Method for Radio Channel Selection. Filed Apr. 18, 1980. Patented Jan. 5, 1982.

Patent 4,310,843. Electron Beam Controlled Array Antenna. Filed Mar. 6, 1970. Patented Jan. 12, 1982.

Patent 4,311,290. Aircraft Recovery System. Filed Nov. 1, 1981. Patented Jan. 19, 1982.

Patent 4,313,170. Autocorrelation Side Lobe Reduction Device for Phase-Coded Signals. Filed June 23, 1980. Patented Jan. 26, 1982.

Patent 4,314,743. Optical Gain Control Device. Filed Nov. 19, 1979. Patented Feb. 9, 1982.

Patent 4,314,784. Seafloor Attachment Bolts. Filed May 22, 1980. Patented Feb. 9, 1982.

Patent 4,314,873. Method for Depositing Hetero-epitaxially InP on GaAs Semi-Insulating Substrates. Filed July 5, 1977. Patented Feb. 9, 1982.

Patent 4,315,093. Fluorinated Polyphthalocyanines. Filed Nov. 9, 1979. Patented Feb. 9, 1982.

Patent 4,315,255. Multiple-Quantum Interference Superconducting Analog-to-Digital Converter. Filed Oct. 27, 1980. Patented Feb. 9, 1982.

Patent 4,315,258. Transmissive and Reflective Liquid Crystal Display. Filed Feb. 15, 1980. Patented Feb. 9, 1982.

Patent 4,315,324. Directly Modulated Sonobuoy Transmitter Using Surface Acoustic Wave Sensor. Filed Sept. 11, 1980. Patented Feb. 9, 1982.

Patent 4,315,609. Target Locating and Missile Guidance System. Filed June 16, 1971. Patented Feb. 16, 1982.

Patent 4,315,651. Coupling for Quick Attachment to Plate-Like Structure. Filed Apr. 3, 1980. Patented Feb. 16, 1982.

Patent 4,316,201. Low-Barrier-Height Epitaxial Ge-GaAs Mixer Diode. Filed May 8, 1980. Patented Feb. 16, 1982.

Patent 4,317,211. Manchester Code Decoding Apparatus. Filed June 2, 1980. Patented Feb. 23, 1982.

Patent 4,317,797. Resin Purger. Filed Aug. 25, 1980. Patented Mar. 2, 1982.

Patent 4,318,099. Clutter Filter Using a Minimum Number of Radar Pulses. Filed Feb. 21, 1980. Patented Mar. 2, 1982.

Patent 4,319,242. Integrated Weapon Control Radar System. Filed Mar. 4, 1980. Patented Mar. 9, 1982.

Patent 4,319,372. Submarine Rescue Cable Reel. Filed Apr. 7, 1980. Patented Mar. 16, 1982.

Patent 4,320,289. Precision Laser Pulse Radiometer. Filed May 27, 1980. Patented Mar. 16, 1982.

Patent 4,320,703. Target Detecting Device. Filed May 27, 1966. Patented Mar. 23, 1982.

Patent 4,321,549. Switching Quadrature Detector. Filed May 6, 1980. Patented Mar. 23, 1982.

Patent 4,321,559. Multiwavelength Self-Pumed Solid State Laser. Filed Apr. 3, 1980. Patented Mar. 23, 1982.

Patent 4,321,871. Target Detecting Device. Filed Apr. 24, 1968. Patented Mar. 30, 1982.

Patent 4,323,025. Torpedo Steering Control System. Filed Mar. 7, 1961. Patented Apr. 6, 1982.

Patent 4,323,900. Omnidirectional Microstrip Antenna. Filed Oct. 1, 1979. Patented Apr. 6, 1982.

Patent 4,324,272. Anti-Slosh Baffle Compartment Assembly. Filed Oct. 17, 1980. Patented Apr. 13, 1982.

Patent 4,324,378. High-Torque/Acceleration Stabilized Sensor Platform. Filed Mar. 3, 1980. Patented Apr. 13, 1982.

Patent 4,324,556. Portable Cobb Analyzer. Filed Mar. 25, 1980. Patented Apr. 13, 1982.

Patent 4,325,181. Simplified Fabrication Method for High-Performance Fet. Filed Dec. 17, 1980. Patented Apr. 20, 1982.

Patent 4,325,246. Compass Checker. Filed May 29, 1981. Patented Apr. 20, 1982.

Patent 4,325,744. Method and Composition for Cleaning Metal Surfaces with a Film-Metal Composition. Filed July 25, 1980. Patented Apr. 20, 1982.

Patent 4,327,377. Phase-Slipped Time Delay and Integration Scanning System. Filed June 6, 1980. Patented Apr. 27, 1982.

Patent 4,327,493. Method and Apparatus for Measurement of Distance Between Holes and Parrallel Axes. Filed Mar. 4, 1980. Patented May 4, 1982.

Patent 4,328,496. Delay Control for a Pulse Repeat-Back Jamming System. Filed Aug. 27, 1958. Patented May 4, 1982.

Patent 4,328,498. Phased Array Antenna for Satellite. Filed May 21, 1970. Patented May 4, 1982.

Patent 4,328,502. Continuous Slot Antennas. Filed June 21, 1965. Patented May 4, 1982.

Patent 4,328,554. Programmable Frequency Synthesizer. Filed July 3, 1980. Patented May 4, 1982.

Patent 4,328,569. Array Shading for a Broadband Constant Directivity Transducer. Filed Nov. 14, 1979. Patented May 4, 1982.

Patent 4,328,736. Fuseless Explosive Propellant. Filed June 2, 1980. Patented May 11, 1982.

Patent 4,329,540. Bocking Feed-Through for Coaxial Cable. Filed Apr. 3, 1980. Patented May 11, 1982.

Patent 4,329,651. Chirp Filters/Signals. Filed Apr. 9, 1980. Patented May 11, 1982.

Patent 4,329,938. Evaporator Tool with Remote Substrate Reorientation Mechanism. Filed Oct. 3, 1980. Patented May 18, 1982.

Patent 4,330,238.Automatic Actuator for Variable Speed Pump. Filed Mar. 4, 1980. Patented May 18, 1982.

Patent 4,330,343. Refractory Passivated Ion-Implanted GaAs Ohmic Contacts. Filed Dec. 10, 1980. Patented May 18, 1982.

Patent 4,330,570. Selective Photoinduced Condensation Technique for Producing Semiconducting Compounds. Filed Apr. 24, 1981. Patented May 18, 1982.

Patent 4,330,593. Pzt/Polymer Composites and Their Fabrication. Filed Nov. 13, 1980. Patented May 18, 1982.

Patent 4,330,632. Lightweight Concrete Using Polymer Filled Aggregate for Ocean Applications. Filed Dec. 24, 1980. Patented May 18, 1982.

Patent 4,330,689. Multirate Digital Voice Communication Processor. Filed Jan. 28, 1980. Patented May 18, 1982.

Patent 4,330,763. Resonantly Pumped Mid-Ir Laser. Filed Mar. 19, 1980. Patented May 18, 1982.

Patent 4,330,768. Dispersion Compensated Acoustic Surface Waveguides Using Diffused Substrates. Filed Oct. 2, 1980. Patented May 18, 1982.

Patent 4,330,784. Variable Waveguide Continuous Slot Antenna. Filed Feb. 13, 1967. Patented May 18, 1982.

Patent 4,330,855. Apparatus for Multiplexing Digital Signals. Filed Mar. 3, 1980. Patented May 18, 1982.

Patent 4,330,895. Stabilizer for Reducing Motion of an Object Disposed in a Fluid. Filed Oct. 1, 1979. Patented May 25, 1982.

Patent 4,330,932. Process for Preparing Isolated Junctions in Thin-Film Semi-Conductors Utilizing Shadow-Masked Deposition to Form Graded-Side Means. Filed May 14, 1980. Patented May 25, 1982.

Patent 4,331,374. Coaxial Termination for Cable In-Line Electronic Applications. Filed July 24, 1980. Patented May 25, 1982.

Patent 4,333,079. Doppler Signal Processing Circuit. Filed July 21, 1970. Patented June 1, 1982.

Patent 4,333,169. Flow Noise Suppression System. Filed Oct. 4, 1966. Patented June 1, 1982.

Patent 4,334,048. Olefin Metathesis. Filed May 26, 1981. Patented June 8, 1982.

Patent 4,334,229. Leaky Waveguide Continuous Slot Antenna. Filed Nov. 12, 1968. Patented June 8, 1982.

Patent 4,334,277. High-Accuracy Multipliers Using Analog and Digital Components. Filed Dec. 11, 1978. Patented June 8, 1982.

Patent 4,335,520. Survey Spar System for Precision Offshore Seafloor Surveys. Filed Sept. 22, 1980. Patented June 22, 1982.

Patent 4,335,670. Flexible Side Connector for Floating and Elevated Platforms. Filed July 14, 1980. Patented June 22, 1982.

Patent 4,336,047. Method for Fabricating Single-Mode and Multimode Fiber Optic Access Couplers. Filed Jan. 2, 1981. Patented June 22, 1982.

Patent 4,336,362. Acetylene-Terminated Dianil Monomer and the Polymer Thereform. Filed Mar. 2, 1982. Patented June 22, 1982.

Patent 4,336,367. Epoxy Adhesive Composition. Filed May 15, 1969. Patented June 22, 1982.

Patent 4,336,591. Maximum Depth Monitoring Apparatus. Filed July 7, 1982. Patented June 22, 1982.

Patent 4,337,105. Spherical Segment Inner Surface Force Applicator for Laminating Non-Planar Surfaces. Filed Sept. 4, 1980. Patented June 29, 1982.

Patent 4,338,466. Prostaglandin Analogs and Process of Preparation Thereof. Filed Apr. 2, 1981. Patented July 6, 1982.

Patent 4,338,560. Albedd Radiation Power Converter. Filed Oct. 12, 1979. Patented July 6, 1982.

Patent 4,338,603. Self Adaptive Correlation Radar. Filed May 25, 1967. Patented July 6, 1982.

Patent 4,339,683. Electrical Connection. Filed Feb. 4, 1980. Patented July 13, 1982.

Patent 4,339,764. PbS_xSe_{1-x} Semiconductor. Filed Mar. 26, 1979. Patented July 13, 1982.

Patent 4,339,930. Control System for Solar-Assisted Heat Pump System. Filed July 3, 1980. Patented July 20, 1982.

Patent 4,340,755. Diguanide Diperchlorate and Process for Preparation Thereof. Filed Oct. 10, 1980. Patented July 20, 1982.

Patent 4,341,651. Compositions and Methods for Generation of Gases Containing Hydrogen or Hydrogen Isotopes. Filed Aug. 26, 1980. Patented July 27, 1982.

Patent 4,342,228. Angular Accelerometer. Filed Nov. 4, 1980. Patented Aug. 3, 1982.

Patent 4,342,734. Method for Forming Y-Boron. Filed July 20, 1981. Patented Aug. 3, 1982.

Patent 4,346,420. Magnetoplasmadynamic Switch. Filed May 28, 1980. Patented Aug. 24, 1982.

Patent 4,346,520. Alinement Method. Filed Jan. 24, 1978. Patented Aug. 31, 1982.

Patent 4,346,662. Self-Contained Backflush/Start System for Suction LFC Undersea Vehicle. Filed May 7, 1980. Patented Aug. 31, 1982.

Patent 4,350,041. System and Method for Measurement of Dynamic Angular or Linear Displacement. Filed Oct. 9, 1980. Patented Sept. 21, 1982.

ERRATUM

In the Official Gazette of Dec. 16, 1980 under TRADEMARK REGISTRATIONS CANCELLED, Section 8, on page TM 128, "986,906. AMERICAN HERITAGE, (U.S.Cl. 28) Reg. 6-25-74." should be deleted.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 15, 1983

D. 266,030	4,337,758	4,350,092	4,355,780
4,191,486	4,337,876	4,350,499	4,356,081
4,206,205	4,337,988	4,350,824	4,356,150
4,225,210	4,338,668	4,350,851	4,356,190
4,225,571	4,338,784	4,350,891	4,356,944
4,227,637	4,339,368	4,350,924	4,357,046
4,243,994	4,341,023	4,350,963	4,357,116
4,291,022	4,343,219	4,351,215	4,357,226
4,298,896	4,343,406	4,351,238	4,357,519
4,305,471	4,343,917	4,351,470	4,357,664
4,309,503	4,344,707	4,351,645	4,357,726
4,309,669	4,345,103	4,351,973	4,357,860
4,319,270	4,345,386	4,352,101	4,358,572
4,322,072	4,345,403	4,352,382	4,358,952
4,322,487	4,345,721	4,352,547	4,359,501
4,322,520	4,347,423	4,352,680	4,360,059
4,323,064	4,347,846	4,352,821	4,360,556
4,323,475	4,347,927	4,353,023	4,360,613
4,324,180	4,347,970	4,353,039	4,360,658
4,324,789	4,348,014	4,353,121	4,360,685
4,326,895	4,348,081	4,353,554	4,360,908
4,328,008	4,348,508	4,353,705	4,360,913
4,330,815	4,348,534	4,354,164	4,360,958
4,331,604	4,348,665	4,354,514	4,361,835
4,332,880	4,348,968	4,354,667	4,362,041
4,337,248	4,349,081	4,355,361	4,363,481
4,337,373	4,349,895	4,355,470	

Disclaimers

3,237,230.—*John L. Forrest,* Windsor, N.Y. APPARATUS FOR REMOVING MARGINAL STRIPS OF COATING FROM A PRECOATED WEB. Patent dated Mar. 1, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,255,801.—*Royal C. Tabordon,* Casco, Wis. POWER OPERATED TIRE CHANGING STAND. Patent dated June 14, 1966. Disclaimer filed June 25, 1980, by the assignee, *Hennessy Industries, Inc.*

Hereby enters this disclaimer to claims 1, 5 and 11 of said patent.

3,285,747.—*Robert F. Coles,* North St. Paul, Minn. COLOR FORMERS CONTAINING A M-ALKYLPHENOXYACYL GROUP. Patent dated Nov. 15, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,316,093.—*Edward Cerwonka,* Binghamton, N.Y. COLORED PHOTOIMAGES FROM FERRIC SALTS OF PHENOLIC a-HYDROXY ACIDS. Patent dated Apr. 25, 1967. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,476,940.—*Robert W. Houser,* Vestal, N.Y. PHOTOMULTIPLIER SYSTEM WHEREBY DYNODE VOLTAGE SUPPLY IS VARIED IN ACCORDANCE WITH MODULATION OF INCIDENT LIGHT HOLDING OUTPUT CURRENT CONSTANT AND USING MEASURE OF DYNODE VOLTAGE AS MEASURE OF MODULATION OF LIGHT. Patent dated Nov. 4, 1969. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,523,793.—*Vincent J. Miceli,* Conklin, N.Y. DEVELOPERS CONTAINING SILVER HALIDE SOLVENTS. Patent dated Aug. 11, 1970. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,624,724.—*Barnard C. Sheffer,* Binghamton, N.Y. MEDICAL X-RAY SENSITOMETER. Patent dated Nov. 30, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,994,973.—*Clarence E. Habermann* and *Ben A. Tefertiller,* Midland, Mich. CATALYSTS FOR THE HYDRATION OF NITRILES TO AMIDES. Patent dated Nov. 30, 1976. Disclaimer filed Dec. 6, 1982, by the assignee, *The Dow Chemical Co.*

Hereby enters this disclaimer to claims 1–11, 14, 15, 16, 18 and 19 of said patent.

4,066,457.—*Theodore Panasik,* Vestal; *Felix Viro,* Apalachin; *Burton H. Waxman,* Endwell and *Robert T. Shannahan,* Endicott, N.Y. COLOR DEVELOPER FOR DIFFUSION TRANSFER. Patent dated Jan. 3, 1978. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

4,158,840.—*Carl E. Schwab,* Huntington Station, N.Y. 3-D RADAR COMPRISING 2-D RADAR WITH HEIGHT FINDING ATTACHMENT. Patent dated June 19, 1979. Disclaimer filed Nov. 8, 1982, by the assignee, *General Signal Corp.*

Hereby enters this disclaimer to claims 1 and 8 of said patent.

4,188,588.—*Andrew G. F. Dingwall,* Bridgewater, N.J. CIRCUITRY WITH UNBALANCED LONG-TAILED-PAIR CONNECTIONS OF FET'S. Patent dated Feb. 12, 1980. Disclaimer filed Oct. 19, 1982, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 25, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-06-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-31-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-15-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-30-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	2-13-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-20-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	1-09-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-05-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-20-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during December 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... **Numbers 3,221,339 to 3,226,728, inclusive**

Plant Patents ..... **Numbers 2,577 to 2,584 inclusive**

REISSUES

FEBRUARY 15, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,148

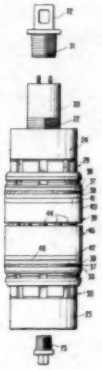
SUB-SEA EQUIPMENT TEST AND ISOLATION TOOL

John H. Mayo, 404 Alonda Dr., Lafayette, La. 70503

Original No. 4,152,924, dated May 8, 1979, Ser. No. 925,449, Jul. 17, 1978. Application for reissue Mar. 10, 1981, Ser. No. 242,247

Int. Cl.³ G01M *3/28*

U.S. Cl. 73—40.5 R **21 Claims**



16. A test and isolation tool for sub-sea well equipment comprising a tool body portion adapted for insertion into a well head housing having spaced internal surfaces to be tested for leakage, spaced expandable testing seals on the body portion adapted to register with said surfaces, pressure-responsive means on the body portion operable to expand said seals into test sealing engagement with said surfaces, a first pressure fluid delivery means on the body portion delivering fluid to said pressure-responsive means at a pressure somewhat above test pressure and sufficient in magnitude to expand said seals to a degree enabling said surfaces to resist leakage under test pressure, and a second pressure fluid delivery means on the body portion separate from and isolated from the first delivery means and delivering fluid into a chamber of the body portion between said seals and surfaces at said test pressure.

Re. 31,149

APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Melbourne, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Original No. 4,234,539, dated Nov. 18, 1980, Ser. No. 69,111, Aug. 23, 1979. Continuation of Ser. No. 846,337, Oct. 8, 1977, Pat. No. 4,234,538, which is a continuation-in-part of Ser. No. 808,166, Jun. 20, 1977, abandoned. Application for reissue Aug. 27, 1981, Ser. No. 296,778

Int. Cl.³ G01N *21/24, 1/14*

U.S. Cl. 422—64 **11 Claims**

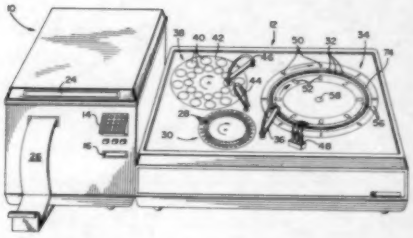
1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substances carried [in] *by* a plurality of respective [cuvettes whose walls are at least to some extent capable of transmitting] *sample support members and which produce an optical effect when exposed to* radiant energy which comprises,

A. a support structure,

B. a [horizontally disposed cuvette] *sample support member* carrier *disposed in a first plane and* having a plurality of [cuvettes] *sample support members* disposed thereon in a circular array around the periphery of the carrier and the array having a central [vertical] axis *normal to said first plane*, the [cuvette] *sample support member* carrier being nonrotatably mounted on the support structure,

C. a rotor [horizontally] disposed parallel with the [cuvette] *sample support member* carrier and mounted for rotation on the said axis,

D. a plurality of photometers arranged on said rotor and each including a photoresponsive element and there being radiant energy source means serving all of the photoresponsive elements and directing a [direct rectilinear] beam of radiant energy to each of them whereby there is at least one beam for each element, *each beam having a fixed orientation relative to its associated photoresponsive element that is maintained at all times during rotation of the*



rotor, the source means and elements being geometrically arranged in a radial configuration around the rotor, and the beams being so located that each will [cut through] *be intercepted by* all of the [cuvettes] *sample support members* in sequence during rotation of the rotor,

E. means for driving the rotor in a rotary movement,

F. the photoresponsive elements being responsive to the beams to produce electrical signals when intercepted by [cuvettes] *sample support members,* the signals being related to the chemical conditions of sample substance, if any, carried by the respective [cuvettes] *sample support members,*

G. means for generating usable data from any such signals associated with said support structure and [non-rotatable,] *nonrotatable carrier* and

H. means for coupling the signals from the rotor to said last mentioned means.

Re. 31,150

APPARATUS FOR MONITORING CHEMICAL REACTIONS AND EMPLOYING MOVING PHOTOMETER MEANS

Guenter Ginsberg, Miami, Fla.; Thomas Horne, Harpenden, England, and Robert L. Kreiselman, Melbourne, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Original No. 4,234,538, dated Nov. 18, 1980, Ser. No. 846,337, Oct. 28, 1977. Continuation-in-part of Ser. No. 808,166, Jun. 20, 1977, abandoned. Application for reissue Aug. 27, 1981, Ser. No. 296,780

Int. Cl.³ G01N *21/24, 1/14*

U.S. Cl. 422—64 **21 Claims**

1. Apparatus for monitoring chemical reactions occurring in a plurality of liquid or the like sample substantances carried [in] *by* a plurality of respective [cuvettes whose walls are at

least to some extent capable of transmitting] *sample support members, said sample substances and support members being capable of producing an optical effect when exposed to* radiant energy which comprises:

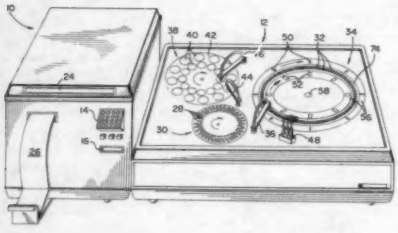
A. support means,

B. a rotor mounted on said support means for rotation thereon on an axis,

C. a turntable mounted coaxially with the rotor for rotation relative to said support means, a plurality of [radiant energy transmissive cuvettes] *sample support members* mounted to the turntable and disposed in a circular arrangement coaxially with said axis and adapted to have sample substances producing chemical reactions carried [in] *by* at least some of said [cuvettes] *sample support members*,

D. first drive means for rotating the turntable on its axis in a first program of rotation whereby the [cuvettes] *sample support members* describe an annular path as the turntable rotates,

E. second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time,



F. photometer means mounted on the rotor and defining at least one beam path for radiant energy which extends at least [through] *toward* said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said [cuvettes] *sample support members* which intersects such beam path during rotation of the turntable *will be exposed to said beam when so intersected and produce an optically changed beam leaving said sample support member*,

G. the photometer means including means responsive to any radiant energy projected along said beam path to produce electrical signals as the [cuvettes] *sample support members* intersect the beam path, which signals are related to chemical conditions of the sample substances, if any, which may be contained in said [cuvettes] *sample support members*, there being two radiant energy detectors and means for dividing the beam path into two parts and directing the parts through different strata of the [cuvettes] *sample support members*,

H. means for generating usable data from any such signals, and

I. means for coupling at most all of the electrical signals from said photometer means to said data generating means.

Re. 31,151

INEXPENSIVE SOLAR CELL AND METHOD THEREFOR

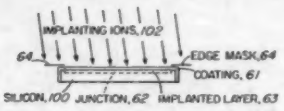
William J. King, 9 Putnam Rd., Reading, Mass. 01867

Original No. 4,086,102, dated Apr. 25, 1978, Ser. No. 749,776, Dec. 13, 1976. Application for reissue Apr. 7, 1980, Ser. No. 137,911

Int. Cl.³ H01L *31/06, 31/18*

U.S. Cl. 136—256 **17 Claims**

1. A solar cell comprising a semi-conductor device including a rectifying junction and having a front surface, electrically conductive members in contact with said surface, and a layer of hermetic material hermetically bonded to said front surface and to at least as much of the edge surfaces as is necessary to cover said junction, thereby protecting said junction, said



material having an index of refraction and a thickness approximating theoretically calculated values for perfect antireflective [[(AR)]] coating.

Re. 31,152

ALARM BUZZER

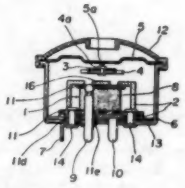
Mitsuo Sakaguchi; Hikoji Iwasaki, and Shigeo Shimoya, all of Tokyo, Japan, assignors to Kobishi Electric Co., Ltd., Japan

Original No. 4,075,626, dated Feb. 21, 1978, Ser. No. 765,466, Feb. 4, 1977. Application for reissue Jun. 11, 1979, Ser. No. 47,091

Claims priority, application Japan, Nov. 11, 1976, 51-151613[U]; Nov. 11, 1976, 51-151614[U]; Nov. 11, 1976, 51-151615[U]

Int. Cl.³ G10K *1/00*

U.S. Cl. 340—388 **17 Claims**



1. An alarm buzzer comprising an electromagnet, a yoke on which said electromagnet is mounted while maintaining insulation from a housing, an armature which is held with a plate spring on said yoke and is attracted by said electromagnet, a vibratory plate which contacts said armature, and a housing which incorporates the above components wherein a bobbin of said electromagnet is made of an insulating material and consists of a hollow cylinder which receives an iron core in it and is wrapped with coil on its outer periphery, first flange provided on one end of said hollow cylinder, second flange provided on the other end of the hollow cylinder and at least one hollow projection provided on said second flange in a direction parting from said first flange, said yoke is provided with at least one hole into which said hollow projections of the bobbin is inserted, and the bobbin and the yoke are fixed to the housing of the alarm buzzer by a fixture which is inserted into the hollow projection of the bobbin inserted into said hole of the yoke.

Re. 31,153

MASS MEMORY ACCESS METHOD AND APPARATUS

Richard W. Caddell, Brookfield, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

Original No. 4,198,699, dated Apr. 15, 1980, Ser. No. 16,149, Mar. 1, 1979. Application for reissue Sep. 2, 1980, Ser. No. 183,352

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—230 **6 Claims**

5. Apparatus for transferring digital data between a mass memory having a plurality of storage loops, with each storage loop having "N" cells each accepting a data bit; and

having a loop position counter for indicating which cell in said loop is operative to receive or transmit data; and

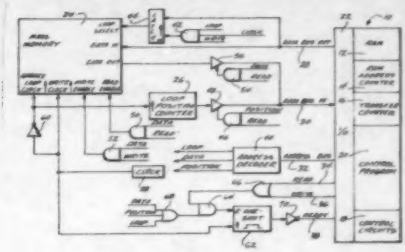
a random access memory having an address counter therewith having "N" steps in the counting cycle, said apparatus comprising;

a transfer counter means having "N" counting steps in its counting cycle;

first circuit means coupled to said random access memory and to said mass memory for (a) selecting a unique one of said plurality of mass memory locations, (b) determining the cell position in said selected loop, and (c) indicating the data that is to be transferred between said random access memory and said selected loop of said mass memory;

second circuit means coupled to said transfer counter, to said random access memory address counter, and to said first circuit means for resetting said transfer counter and for adjusting said random access memory address counter in accordance with the loop cell position determined by said first circuit means; and

third circuit means coupled to said first circuit means, to said random access memory, and to said mass memory for repetitively (a) advancing the loop position (b) advancing the count of said transfer counter means, and (c) transferring data between said selected loop of said mass memory and said random access memory each time said first circuit means



indicates that data is to be transferred between said random access memory and said mass memory until said transfer counter means overflows.

PLANT PATENTS

GRANTED FEBRUARY 15, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,982

ROSE PLANT

Gerardus J. C. Duivenvoorden, Leidsemeerstraat 18, Buitenkaag, Netherlands

Filed Jan. 12, 1981, Ser. No. 224,623
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—25 **1 Claim**

1. An asexually-reproduced rose plant of the Floribunda class, substantially as herein illustrated and described, namely, a sport of the Merko variety, and characterized particularly in the light pink coloration of its blooms, in addition to the abundance of its blooms, even though usually borne singly.

4,983

SEEDLING ROSE NAMED HILSET

Robert G. Jelly, Richmond, Ind., assignor to E. G. Hill Co., Inc., Richmond, Ind.

Filed Aug. 14, 1981, Ser. No. 292,887
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—26 **1 Claim**

1. A new and distinct rose plant, substantially as herein shown and described, characterized by its free and abundant production of light pink flowers and its moderately free and vigorous growth habit.

PATENTS

GRANTED FEB. 15, 1983

ERRATA

For CLASS	See PATENT NO.
445–003	4,373,237
464–048	4,373,358
184–006	4,373,421
186–064	4,373,611
414–225	4,373,840
436–539	4,373,931
436–501	4,373,932
118–103	4,373,985
436–060	4,374,041
523–153	4,374,059
436–546	4,374,120
372–092	4,374,365

PATENTS

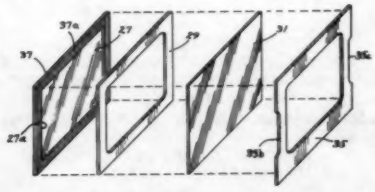
GRANTED FEBRUARY 15, 1983

GENERAL AND MECHANICAL

4,373,211
PROTECTIVE CHEST SHIELD
Noel Goudreau, Bourbonnais; Nick Colevris, Bradley, and Carl Southard, Bourbonnais, all of Ill., assignors to Trico Products Incorporated, Bradley, Ill.
Filed Jul. 23, 1981, Ser. No. 285,959
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **9 Claims**

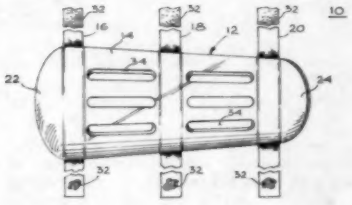
1. A protective chest shield comprising: a uniform cushion sheet of polyvinyl chloride closed cell foam being adapted for positioning adjacent to a wearer's body, a uniform rigid sheet of polypropylene secured to the sheet of polyvinyl chloride foam and being substantially co-extensive therewith, said rigid sheet and said cushion sheet having aligned apertures extending therethrough, each aperture having its outer periphery in the cushion sheet aligned with its outer periphery in the portion of the rigid sheet adjacent to the cushion sheet, a shoulder strap connected to the cushion sheet and to the rigid sheet for supporting the cushion sheet and the rigid sheet, and a chest strap connected to opposite ends of the cushion sheet and the rigid sheet for holding the cushion sheet adjacent to the wearer's chest.

4,373,212
LIGHT BLOCKING LENS FOR WELDER HELMET
John C. West, Minneapolis, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.
Filed Nov. 12, 1980, Ser. No. 206,025
Int. Cl.³ A61F *9/06*
U.S. Cl. 2—8 **1 Claim**



1. A welding helmet arranged and constructed to avoid a halo effect within the face shield thereof, having in combination
- a face shield of a welding helmet,
- a sight opening within said face shield,
- a flange extending inwardly of said sight opening forming the perimeter thereof,
- a lens disposed within said sight opening having its edge portions bearing against said flange,
- said lens having the entire edge portion thereabout caused to be impervious to the passage of light,
- a filter lens underlying said first mentioned lens,
- a spacer disposed between said first and second mentioned lenses,
- inward projections formed at each side edge portion of said sight opening inwardly thereof, and
- a spring-like frame member engaging said projections with its respective end portions and being biased outwardly of said filter lens by said projections and being snapped inwardly against said filter lens for positive engagement of said edge portion of said first mentioned lens against said flange.

4,373,213
ARCHERY ARM GUARD
Roger S. Erlandson, 8600 Rubio Dr., Elk Grove, Calif. 95624
Filed Jan. 16, 1981, Ser. No. 225,472
Int. Cl.³ A41D *13/08*; A63B *57/00*
U.S. Cl. 2—16 **7 Claims**

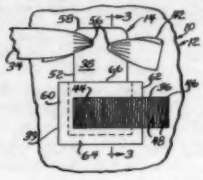


1. An improved archery arm guard, said guard comprising, in combination:
- a. an elongated, curved, protective, smooth surfaced, self-supporting, rigid plastic body having a plurality of air holes, said body defining a plurality of passageways extending therethrough; and,
- b. a plurality of parallel elastic stretchable bands slideably disposed in said passageways and extending outwardly therefrom for releasably securing said body to an archer's arm to protect against bowstring slap, said body being curved transversely to fit the contour of an archer's arm, the rear end thereof being curved down to prevent inadvertent hooking of the bowstring under said rear end and the front end thereof being curved up to prevent binding thereof against an archer's wrist.

4,373,214
DISPOSABLE GARMENT WITH CARD POCKET
Cynthia A. Wichman, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Apr. 22, 1982, Ser. No. 371,026
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—51 **9 Claims**

1. A disposable garment, comprising:
- a gown having a pair of sleeves, a front, a pair of side margins defining an open back for the gown, and a pocket having a pair of opposed closed sides, with one end of the pocket being closed, and the other end of the pocket being open;
- a first belt having one end secured to the gown and the other end being free;
- a second belt having one end secured to the gown; and

a transfer card having one end received in the pocket through the open other pocket end, and means for releasably attaching the other end of the first belt adjacent the other end of the card.



4,373,215

DOUBLE SOCK CONSTRUCTION

Paul A. Guigley, Mohnton, Pa., assignor to Wm. G. Leininger Knitting Company, Mohnton, Pa.

Filed Jun. 19, 1980, Ser. No. 160,966
Int. Cl.³ A41B 11/00
U.S. Cl. 2—239 5 Claims

1. A double sock comprising an integral knit structure comprising an inner sock and an outer sock circumferentially joined at their respective ends, said inner sock having a tubular body portion, a closed toe portion at the free end of said inner sock body portion, said toe portion being of a reduced thickness with respect to said body portion, an outer sock having a tubular body portion of larger diameter than said inner sock body portion, a toe portion at the free end of said outer sock body portion, said outer sock toe portion being of a reduced thickness with respect to said outer sock body portion, the juncture of said inner and outer socks comprising a knitting structure forming a welt to establish a circumferential fold line at the upper end of said double sock, said inner sock being substantially shorter in length than said outer sock, the knitting structure of said inner and outer socks including stretch yarns which permit a resilient conformance thereof with the foot of a wearer.

4,373,216

HEART VALVES HAVING EDGE-GUIDED OCCLUDERS

Jerome J. Klawitter, Austin, Tex., assignor to Hemex, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 200,910, Oct. 27, 1980, abandoned. This application Sep. 15, 1981, Ser. No. 302,693
Int. Cl.³ A61F 1/22
U.S. Cl. 3—1.5 25 Claims

1. A heart valve prosthesis for allowing blood flow therethrough in a specific direction including

a generally annular valve body having an interior surface defining a central passageway for blood flow therethrough,

occluder means for blocking the flow of blood through said passageway, said occluder means having an upstream face and a downstream face,

notches extending through said occluder means between said upstream face and said downstream face and being formed in opposite locations in the periphery of said occluder means,

complementary projections which are elongated generally in a direction between upstream and downstream and of a length substantially greater than the thickness of said occluder means at said notch, which extend generally radially inward from said interior surface into said passageway and which are proportioned to interfit within said notches, said projections being exposed to free flow of blood and having opposite elongated surfaces that are alternately mechanically contacted by edges of said notches during alternate opening and closing movement, the shape of said projections being such to guide said occluder means along a path during shifting between open and closed positions that creates both pivotal and translational movement,

first means in said annular valve body for engaging said upstream face of said occluder means and providing a stop in the closed position, and

second means in said annular valve body for engaging said downstream face of said occluder means and providing a stop in the open position.

4,373,217

IMPLANTATION MATERIALS AND A PROCESS FOR THE PRODUCTION THEREOF

Klaus Draenert, Ottobrunn, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 121,772
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905878
Int. Cl.³ A61F 1/00; C08L 3/08, 3/10; C08K 3/32
U.S. Cl. 3—1.9 17 Claims

1. An implantation material comprising a polymeric base of a polyacrylate, a polymethacrylate, a copolymer of an acrylate and a methacrylate or a mixture thereof and 5–35% by weight of resorbable tricalcium phosphate of a particle size of 50–300 μm and an available pore volume of less than 0.1 ml/g.

16. A method of treating bone defects requiring implantation of a bone cement in a bone of a patient, comprising implanting the implantation material of claim 1 in a bone of the patient.

4,373,218

VARIABLE POWER INTRAOCULAR LENS AND METHOD OF IMPLANTING INTO THE POSTERIOR CHAMBER

Ronald A. Schachar, 1020 Highway 75 North, Denison, Tex. 75020

Filed Nov. 17, 1980, Ser. No. 207,638
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 3—13 37 Claims

1. A posterior chamber intraocular lens for an eye comprising:

a fluid-expandable sac constructed of flexible, transparent material for containing fluid and dimensioned for occupying the posterior chamber of the eye when expanded with fluid in place of at least a portion of the natural lens; and

valve means connected to said sac for extending through the sclera of the eye for selectively varying the optical characteristics of the fluid within said sac in order to vary the optical characteristics of the wearer's eye while said sac is in the wearer's eye.

23. A method for removing a natural lens from an eye and

for implanting into the eye a posterior chamber intraocular lens comprising:

(a) inserting an insertion member through the sclera of the eye and into the posterior chamber;

(b) inserting a collapsible, fluid-expandable sac constructed of flexible transparent material through said member and into the posterior chamber; and

(c) instilling a fluid into said sac for filling said sac in order to provide an artificial lens.

4,373,219

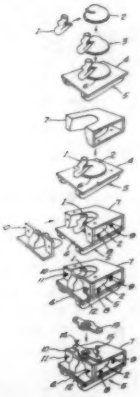
CAST TOILET BASE STRUCTURE

Louis A. Garasi, Canyon Country, and Ronald F. Hayes, Northridge, both of Calif., assignors to Gruber Systems, Inc., Valencia, Calif.

Division of Ser. No. 138,209, Apr. 7, 1980, Pat. No. 4,328,179. This application May 1, 1981, Ser. No. 259,417

Int. Cl.³ E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—300 **9 Claims**



1. A toilet base including an organic plastic bowl and an organic plastic trap that are fixed within and surrounded by thermoset organic plastic that forms the exterior of said toilet base whereby said toilet base is substantially all cast, thermoset organic plastic that forms the structure of said toilet base without need of a separate outer plastic shell.

4,373,220

POOL WATER LEVEL MAINTENANCE APPARATUS AND METHOD

Walter T. Selsted, 22385 Rancho Deep Cliff Dr., Cupertino, Calif. 95014

Filed Jan. 26, 1981, Ser. No. 228,598

Int. Cl.³ F16K *1/18*

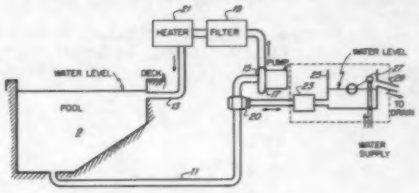
U.S. Cl. 4—508 **6 Claims**

1. Control apparatus for the level of water in a pool that is equipped with a water-circulating pump, the control apparatus comprising:

control tank means having an inlet port and a drain port which is disposed to be positioned at a selected elevation above a desired level of water in the pool;

first valve means positioned to supply water to the control tank means up to the desired level from a source of water under pressure; and

second valve means coupled to the control tank means at a level below the desired level and to the inlet of the water-



circulating pump for the pool, said second valve being biased normally open and being disposed to close in response to lower pressure on the side thereof coupled to the inlet of the water-circulating pump for permitting selective filling and draining of the pool through the second valve means only while the water-circulating pump of the pool is not operating.

4,373,221

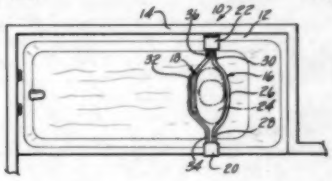
BATHTUB SAFETY SUPPORT

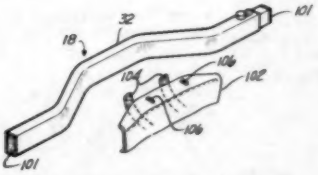
Ruth I. Wilson, 1550 S. Baldwin, Lake Orion, Mich. 48035

Filed Jun. 23, 1980, Ser. No. 161,771

Int. Cl.³ A47K *3/00, 3/02, 3/024, 3/022*

U.S. Cl. 4—559 **7 Claims**





1. An apparatus for holding a person's body in a substantially upright sitting position while bathing in a tub comprising:

a support bar having a curved central portion intermediate two straight end portions;

first selectively engageable means for supporting said end portions between opposing side walls of the tub at one of at least a plurality of predetermined heights and horizontal positions; and

second means for limiting displacement of a person's body away from said curved central portion; wherein said first means comprises at least one bracket having means for securing said bracket to a side wall of said tub, and bracket

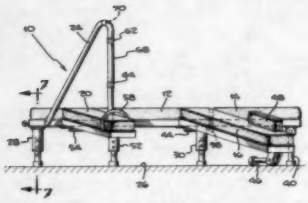
means for slidably receiving at least a portion of each of said two straight end portions at any of said plurality of predetermined heights.

4,373,222

PROSTHETIC BENCH

Richard M. Wolfe, and Katharine N. Dixon, both of Columbus, Ohio, assignors to Enhancement Systems, Inc., Los Angeles, Calif.

Filed Jan. 28, 1980, Ser. No. 115,951
Int. Cl.³ A61G 7/06; A47C 11/00, 20/04
U.S. Cl. 5—431 7 Claims



1. A bench adapted to be used for sexual activity comprising:

platform means for supporting a human body in the supine position including an elongated surface adapted to extend generally horizontally, an extension of said elongated surface projecting from one end thereof and being angularly downwardly adjustable relative to said elongated surface to support the lower portion of the legs of said human body in a lowered position, leg cradle means projecting angularly outwardly from said surface for adjustably supporting the lower extremities of said human body in a spread eagle position, said leg cradle means being adjustable relative to said elongated surface, arm cradle means projecting angularly outwardly from said surface for cradling the arms of said human body, said arm cradle means being angularly adjustable relative to said elongated surface; and

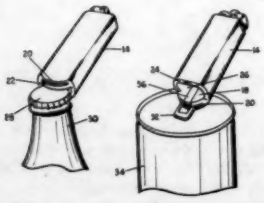
frame means extending upwardly over said surface for grasping by the hands of a person using said bench.

4,373,223

CONTAINER OPENER

Lester Miller, Hopkins, Mich., assignor to Mildoy Enterprises, Hopkins, Mich.

Filed Jan. 29, 1980, Ser. No. 116,566
Int. Cl.³ B25F 1/00; B67B 7/44
U.S. Cl. 7—151 10 Claims



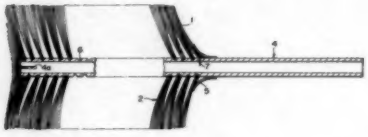
1. A combination container opener and lighter case comprising an elongated body having an internal hollow chamber with an opening at one end of the body such that a disposable lighter may be inserted longitudinally into the chamber, and further having a slot on the body such that a tab of a tab-top container will fit in the slot and the container can be opened by pivoting the opener relative to the container with the tab in the slot, the slot comprising a longitudinal opening at the end of the body opposite the opening for the lighter, a portion of the container opener at one edge of the slot fitting under the tab such that the tab can be slipped into the slot to open the container, the container opener further comprising crown cap removal means for removing a crown cap from a container, the crown cap removal means being located in a recessed opening at the end of the body opposite the one end in which the lighter is mounted, the crown cap removal means comprising a fulcrum portion on one side of a wall extending around the recessed opening and a prying portion on the opposite side of the wall of the recessed opening, with the prying portion including an inwardly extending raised lip on the inside surface of the wall, the fulcrum and prying portions being formed such that the opener may be placed on a crown cap in such a manner that the raised lip engages a bottom edge of the crown portion of the crown cap and the fulcrum portion engages, and extends partially across, the top surface of the crown cap such that when the opener is pivoted upwardly with respect to the container, the crown cap is removed.

4,373,224

METHOD FOR MANUFACTURING A DUSTER AND THE DUSTER MANUFACTURED THEREFROM

Shinji Bandai, Kawanishi; Masao Kajimaki, Ibaragi; Yoshihiro Nakajima, Osaka; Akira Yagi, Takatsuki, and Haruo Nishimura, Osaka, all of Japan, assignors to Duskinfranchise Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1981, Ser. No. 256,254
Int. Cl.³ A47L 13/40
U.S. Cl. 15—1.5 A 7 Claims



1. A method for manufacturing a duster, comprising the steps of:

(a) providing a film consisting of a blend of isotactic polypropylene and polyethylene polymers, said blend being of a weight ratio in the range 95:5 to 70:30, and substantially elongating the film;

(b) treating the elongated film by a corona charge sufficiently to create an electret state in said elongated fi'm;

(c) splitting the elongated film into a plurality of rows of ribbon-like fibers;

(d) crimping the fibers without substantially eliminating the electret state; and

(e) attaching said plurality of rows of crimped ribbon-like fibers to a duster stem.

4,373,225

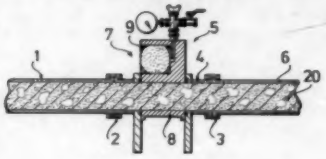
PIPING VALVE WITH A HOUSING FOR THE TRANSFER OF A WIPER INSERTABLE IN CONDUITS THAT SUPPLY PRESSURIZED VISCOUS MATERIAL, PREFERABLY CONCRETE

Karl-Ernst v.Eckardstein, Kamen; Werner Fiala, and Friedrich Schwing, both of Herne, all of Fed. Rep. of Germany, assignors to Friedrich Wilh. Schwing, GmbH, Herne, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,140
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927324; Oct. 31, 1979, 2943967
Int. Cl.³ B08B 9/04
U.S. Cl. 15—104.06 A 11 Claims

1. A piping element inserting a wiper in a pressurized viscous

material conveying conduit means for cleansing movement through the conduit means responsive to forces exerted by a pressure source, said piping element being interposed in said conduit means and including: a transmission pipe (8) coupled to the conduit means (1) and reciprocally movable between a first position in which said pipe is aligned with the conduit means for permitting the conveyance of viscous material through the



conduit means and a second position in which said transmission pipe is out of alignment with the conduit means; and a chamber (9) accommodating the wiper, said chamber being coupled to said transmission pipe and alignable with the conduit means by the reciprocal movement of said transmission pipe, said chamber having connection means (11, 15) couplable to the pressure source for exerting forces on the wiper moving the wiper into and through the conduit means.

4,373,226

CLEANING DEVICE FOR A HUNG FABRIC

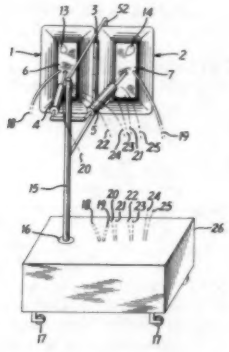
Klaus Läbnitz, Borsigstr. 8, 3180 Wolfsburg 1, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 298,950

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034399

Int. Cl.³ A47L 5/38

U.S. Cl. 15—302 15 Claims



1. A cleaning device for hung fabric and the like comprising a pair of adjacent cleaning flaps, each having an outer wall, an inner wall, and a fluid distribution chamber between the inner and outer walls, hinge means for pivoting said cleaning flaps between a closed position, in which said inner walls are folded together to define a cleaning chamber for tightly retaining a portion of said fabric between said cleaning flaps, and an open position for releasing said fabric, and means for selectively delivering and discharging a plurality of fluids to and from said fluid distribution chambers, wherein each said inner wall has nozzle means communicating with said fluid distribution chambers for delivering and discharging said fluids through said inner wall to and from the fabric.

4,373,227

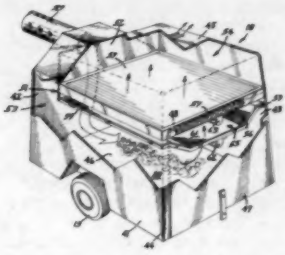
SURFACE MAINTENANCE EQUIPMENT

Paul W. Kimzey, St. Louis Park, and Sherman B. Frederick, New Hope, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Sep. 9, 1980, Ser. No. 185,879

Int. Cl.³ E01H 1/08

U.S. Cl. 15—347 8 Claims



1. Surface maintenance equipment comprising a body structure supported on a plurality of wheels, a downwardly opening housing defining a pickup chamber, means for storage of dirt and debris, means for moving an airstream through said equipment to assist in transporting debris from said pickup chamber to said storage means, and a filtering assembly for cleaning said airstream before discharge, said filtering assembly including a first screen filter for removing larger airborne debris and a second filter for removing fine dust particles from said airstream, said first screen filter including vibration imparting mechanism for dislodgement of said larger debris and said second filter including vibration imparting mechanism for dislodgement of dirt and debris therefrom.

4,373,228

VACUUM CLEANING APPLIANCES

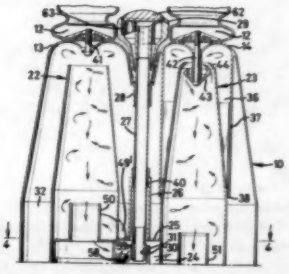
James Dyson, Sycamore House, Bathford, Bath, Avon, BA1 7RS, England

Filed Apr. 15, 1980, Ser. No. 140,497

Claims priority, application United Kingdom, Apr. 19, 1979, 7913690

Int. Cl.³ A47L 9/16

U.S. Cl. 15—350 8 Claims



1. A vacuum cleaning device convertible alternately, into an upright cleaning appliance and into a cylindrical tank type appliance, said appliance comprising a suction head adapted to be moved over a surface to be cleaned when the appliance is in its upright mode, a first housing having one end pivotally connected to said suction head and having an opposite end, a second housing having a first end fixed to said opposite end of the first housing, a pair of frusto-conically shaped cyclones

disposed side by side and enclosed by said second housing, each of said cyclones having a first open end facing said first housing and a larger opposite end, a flexible hose connecting said suction head with one of said frusto-conical cylones for flow of air into the said frusto-conical cyclone, means connecting said side-by-side cyclones for flow of air therebetween, a motor and fan assembly disposed in said first housing for sucking air into said suction head and into said flexible hose, means disposed above each of said first open ends of the frusto-conically shaped cyclones within the said second housing comprising an inverted conically shaped member disposed above the smaller open end of each of the cyclones with its apex facing said smaller open end to interrupt flow of air through the said smaller open end and intercept suspended solids in the air, means comprising third and fourth housings disposed around the cyclones for directing intercepted solids falling from the air towards the first suction head and into a receptacle therefor, means on the first housing for rollably supporting the appliance in its upright mode, and a rotary brush supported across said suction head to contact said surface as the appliance in its upright mode is moved over the surface to be cleaned,

means for moving the applicance in its upright mode comprising a pair of wheels rotatably mounted on said first housing;

means fixed to said second housing for lifting and moving the appliance while in its cylindrical tank type mode.

4,373,229

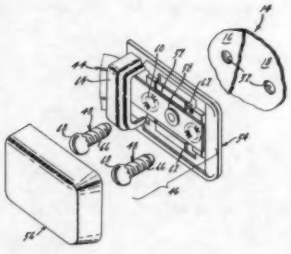
FASTENING SYSTEM FOR ASSIST STRAPS AND THE LIKE

Ronald D. Moore, Grosse Pointe, Mich., assignor to Chivas Products, Limited, Sterling Heights, Mich.

Filed Jun. 5, 1980, Ser. No. 156,602

Int. Cl.³ A47B *95/02*

U.S. Cl. 16—125 **8 Claims**



8. A fastening system for fastening assist straps and the like to a panel or other member comprising:

a metal band extending through the length of said assist strap having an end;

a threaded fastener having a first surface which engages said end of said metal band to fasten said assist strap, said first surface having recesses and peaks;

said end of said metal band being formed by stamping to provide a second surface which engages said first surface of said fastener, said second surface having recesses and peaks which are correlative to said peaks and recesses, respectively, of said fastener so that the peaks of one of said surfaces reside in the recesses of the other of said surfaces when said surfaces are engaged.

4,373,230

FOUR-JOINT HINGE

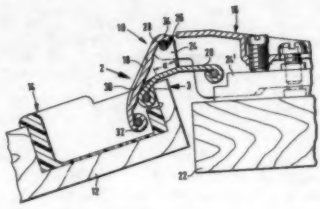
Karl Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG, Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Aug. 5, 1981, Ser. No. 290,229

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033713

Int. Cl.³ E05F *1/08, 5/02*

U.S. Cl. 16—288 **8 Claims**



1. A hinge for a cabinet door, comprising: two hinge links pivotingly articulated in the manner of a four-joint hinge, each at one end to a door-related hinge part adapted to be fastened to the cabinet door and each at the other end to a supporting-wall related hinge part adapted to be fastened to a supporting wall of a cabinet, one of said hinge links having at an end portion adjacent the supporting-wall related part two ears bent over at right angles in the direction toward the other hinge link, said ears being of such shape and size that their free edges flatly rest over at least a portion of their length on areas of a confronting flat side of the other hinge link when the cabinet door is in its widest-open position.

4,373,231

APPARATUS FOR CUTTING CONNECTING PORTIONS OF A SAUSAGE CHAIN

Tetsuro Mano, Tokyo, Japan, assignor to Totai Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,573

Claims priority, application Japan, Mar. 13, 1980, 55/32093; Mar. 13, 1980, 55/33090[U]

Int. Cl.³ A22C *11/00*

U.S. Cl. 17—1 F **6 Claims**

1. Apparatus for cutting the connecting portions between sausages forming a sausage chain, said apparatus being adopted for use with sausage chains formed of sausage having a longitudinally curved configuration, said apparatus comprising a sausage position correcting means arranged in the form of an arc, a sausage guide means, a driving drum arranged for receiving sausages transferred through said guide means, said guide means comprising pairs of rollers each disposed in a direction perpendicular to the circumferential surface of the driving drum, the rollers of successive pairs thereof being arranged so that the spacing between the rollers in each pair gradually decreases in the direction of travel of the sausage chain with the drum, a pressing means arranged to face the sausage receiving surface of said driving drum, and a cutter mechanism for cutting the connecting portions of the sausage chain, the cutter mechanism being arranged along the sausage conveyance path of said driving drum, the sausage position correcting means comprising idling rollers which are arranged in a laterally

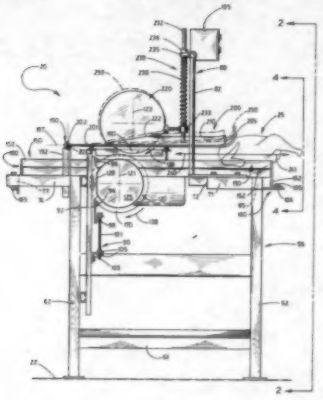
extending manner along the circumference of the driving drum.

4,373,232

POULTRY CUTTING MACHINE

Robert R. Harding, Livingston, and Walter L. Stuermer, Modesto, both of Calif., assignors to Foster Poultry Farms, Livingston, Calif.

Filed Jan. 28, 1981, Ser. No. 229,154
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—11 **6 Claims**



1. A poultry cutting machine for use with a poultry carcass having a generally lozenge-shaped transverse cross section; a pair of transversely opposite dorsal exterior areas; an elongated backbone extending longitudinally of the carcass along one corner of the cross section between the dorsal areas; a breast disposed at the corner of the cross section opposite the backbone; and a pair of ventral exterior areas borne on the breast transversely oppositely thereof and spaced from the dorsal areas, the carcass being moved in a predetermined path of travel longitudinally of the backbone, the machine comprising:

A. a frame;

B. a pair of dorsal guides mounted on the frame at one side of the path of travel and bearing individual first planar surfaces parallel to the path and convergent in a direction away from the path, the first surfaces being disposed individually to engage the dorsal areas oppositely of the backbone and adjacent thereto and as the carcass moves along the path;

C. a pair of ventral guides mounted on the frame oppositely of the path of travel from the dorsal guides and bearing individual second planar surfaces parallel to the path and convergent in a direction away from the path, the second surfaces being disposed in individually facing relation to the first surfaces and spaced therefrom so as individually to engage the ventral areas as the carcass moves along the path;

D. a pair of coaxially related circular saws mounted on the frame for rotation about a first axis disposed oppositely of said first surfaces from said second surfaces, the saws being disposed in individual planes extending parallel to the path in a direction between the dorsal guides and the ventral guides and having individual peripheral cutting edges extending between the first surfaces from said axis to a point disposed in the path centrally of the facing surfaces to cut the carcass oppositely along the backbone and adjacent thereto as the carcass is moved along the path;

E. a single circular saw mounted on the frame for rotation about a second axis disposed oppositely of the second surfaces from the first surfaces in a plane parallel to said planes and disposed centrally therebetween, the single saw including a peripheral cutting edge extending between the second surfaces from the second axis to a point disposed in the path centrally of the facing surfaces to split the breast as the carcass is moved along the path; and

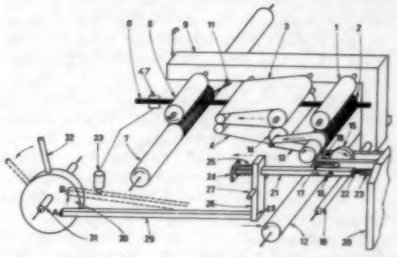
F. means for rotationally driving the single saw and the pair of saws about their respective axes.

4,373,233

DRIVE SYSTEM AND DRAWFRAME SYSTEM FOR A ROVE DRAWING PROCESS

Jean-Louis Faure, Roanne, France, assignor to ASA S.A., Villeurbanne, France

Filed Oct. 27, 1980, Ser. No. 201,238
Claims priority, application France, Nov. 5, 1979, 79 27634
Int. Cl.³ D01H *5/18, 5/86*
U.S. Cl. 19—236 **10 Claims**



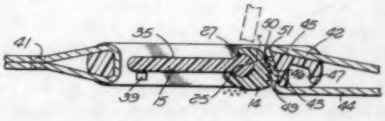
1. A drive system for a drawframe for a rove drawing process, in which the drawframe includes at least one pair of feed rollers, at least one pair of sleeves, at least one pair of drawing rollers, and at least one swinging arm on which one feed roller, one sleeve and one drawing roller of each pair is supported, the swinging arm being displaceable between an inoperative position and an operative position where the pair of feed rollers, pair of sleeves and pair of drawing rollers are engaged under pressure for rove drawing, the drive system comprising a drive shaft and at least one displaceable friction clutch roller which is displaceable between an operative position to engage both the drive shaft and one of the feed rollers for transmitting drive from the drive shaft to the feed roller, and an inoperative position where it is disengaged from the feed roller, the friction clutch roller being displaceable into its operative position to allow progressive engagement of the drawframe at start up.

4,373,234

DEVICE FOR GRIPPING AN ELONGATED FLEXIBLE ELEMENT

Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91001

Filed Apr. 1, 1980, Ser. No. 136,406
Int. Cl.³ A44B *11/12*
U.S. Cl. 24—191 **21 Claims**



1. A buckle comprising:

a first member having two generally parallel side walls and having a first crosspiece extending between said side walls at one end thereof and attachable to a first elongated

element, and a second crosspiece extending between said side walls at their opposite ends and having a gripping surface facing generally toward said first crosspiece;

an actuating member mounted to said first member for relative swinging movement about an axis between a locking position and a released position;

said actuating member having an arm which in said locking position is received generally between said two side walls of the first member, and which in said released position swings to a position of extension outwardly from between said side walls;

said actuating member having a portion at an end of said arm extending between said side walls and projecting into bearing recesses in the side walls to mount the actuating member for said swinging movement;

said last mentioned portion of the actuating member having an outer partial cylindrical surface centered about said axis and interrupted at the location of said arm; and

a locking member connected to said actuating member for swinging movement therewith between said locking and released positions and carried about said last mentioned portion of the actuating member for limited pivotal movement relative thereto;

said locking member having an internal partial cylindrical bearing surface engaging said outer partial cylindrical surface of the actuating member to mount the locking member for said pivotal movement, and being interrupted at the location of said arm with said arm being disposed within the interruption, the width of the interruption being greater than the corresponding dimension of said arm to permit said limited relative pivotal movement;

said locking member having teeth which progressively increase in radius with respect to said axis in a direction progressively gripping a second elongated element more tightly in response to said limited relative movement of the locking member when said actuating member is in said locking position.

4,373,235

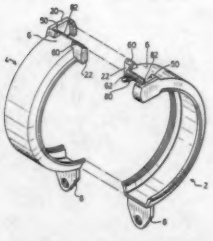
PIPE CLAMP

Jaising Korgaonkar, 158 Christie St., Toronto, Ontario, Canada (M6G 3B4)

Filed Jan. 18, 1982, Ser. No. 340,375

Int. Cl.³ F16L *19/02*

U.S. Cl. 24—285 **12 Claims**



1. A clamp component of a clamping system, said component having first and second end portions, the first end portion having a stud means and stud receiving means, wherein two of said components can cooperate and form at least a limited pivotal connection by inserting the stud means of each component in the stud receiving means of the other component and wherein the second end portion of each component may be mechanically connected for securing the components about an object to be clamped.

4,373,236

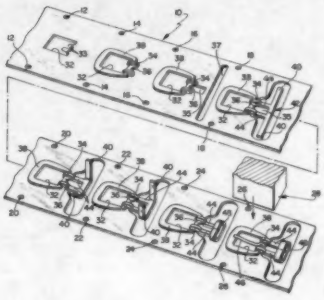
ONE-PIECE BUCKLE AND KEEPER ASSEMBLY

Victor Fera, Lincoln, R.I., assignor to Sage Manufacturing Co., Inc., Providence, R.I.

Filed Nov. 3, 1980, Ser. No. 203,547

Int. Cl.³ B21C *35/04, 37/02;* **B21D** *53/46*

U.S. Cl. 29—3 **5 Claims**



1. A method of manufacturing a buckle and keeper assembly from a flat metal strip with an automated progressive die tool comprising the steps of:

(a) stamping said strip to cut and remove portions therefrom necessary to define the interior edges of a buckle having a transverse pivot bar and a pair of tabs which project slightly inwardly from said pivot bar;

(b) stamping said strip to form the contours of a one-piece buckle and keeper assembly thereon which includes a pair of raised embossments which encompass said tabs and simulate discrete connecting arms which have been bent around said pivot bar to effect their attachment thereto;

(c) stamping said strip to cut and remove portions therefrom necessary to define the interior and exterior edges of a flat unformed keeper assembly comprising a laterally extending keeper bar and a pair of arms which extend integrally from said raised embossments to said keeper bar;

(d) bending the outwardly extending ends of said keeper bar upwardly and inwardly to form a keeper loop; and

(e) stamping said strip to remove said buckle and keeper assembly therefrom.

4,373,237

METHOD OF MANUFACTURING A COLOR TELEVISION DISPLAY TUBE

Gijsbertus Bakker, and Theodorus C. Groot, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1980, Ser. No. 129,502

Claims priority, application Netherlands, Dec. 27, 1978, 7812542

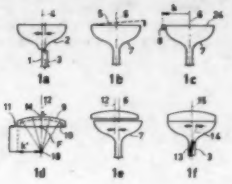
Int. Cl.³ H01J *9/26*

U.S. Cl. 445—3 **8 Claims**

1. A method for providing reference marks on a funnel of a color television display tube, with respect to which a display window will be positioned on a supporting surface at a rectangular end of the funnel during manufacture of the tube, said display window having a centrally-located axis perpendicular thereto which will pass through a deflection center defined by a deflection device subsequently mounted on the tube, said method comprising the steps of:

(a) attaching a centering system to the funnel at the location where the deflection device will be subsequently mounted, said centering system locating a reference point corresponding to the deflection center; and

(b) providing the reference marks at predetermined distances from an axis which passes through the reference point and perpendicularly intersects a plane defined by the supporting surface at the end of the funnel.



4,373,238

SUPPORT ELEMENT WITH FLEXIBLE HEAD PORTION

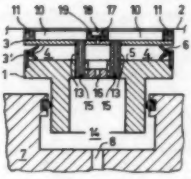
Heinz Güttinger, Winterthur, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 23, 1981, Ser. No. 237,493

Claims priority, application Switzerland, Feb. 29, 1980, 1610/80

Int. Cl.³ B21B *31/32*

U.S. Cl. 29—116 AD **12 Claims**



1. A support element for a movable member having a bearing surface of variable curvature, comprising a head including a flexible plate-like portion which, at one side, coacts with said surface of the movable member to define a bearing gap, and at its opposite side overlies a pressure chamber, the pressure in that chamber acting on the plate-like portion to deflect it toward the movable member; supply means for delivering fluid under pressure to the chamber; and control means responsive to changes in the width of said gap at a central region of the plate-like portion for controlling the magnitude of the pressure in the chamber, whereby the plate-like portion is flexed as required to remain parallel with said bearing surface in spite of changes in the curvature of that surface.

4,373,239

FUSING MEMBER FOR ELECTROSTATOGRAPHIC COPIERS

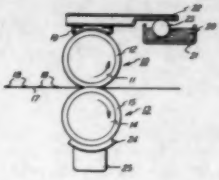
Arnold W. Henry, Pittsford; Jack C. Azar, and John Sagal, Jr., both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1980, Ser. No. 125,404

Int. Cl.³ B21B *31/08*; B60B *5/00*

U.S. Cl. 29—132 **10 Claims**

1. A thermally conductive fuser member for use in an electrographic copying machine comprising a relatively rigid base and a thin layer of a composition coated on said base, said composition comprising the crosslinked product of a mixture of about 100 parts by weight of alpha, omega-hydroxypolydimethylsiloxane, about 128 to 250 parts by weight of finely divided tabular alumina, about 13 to 60 parts by weight of finely divided iron oxide particles, a sufficient amount of a crosslinking agent, and an effective amount of a crosslinking catalyst.



4,373,240

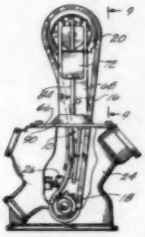
METHOD FOR REMOVING CAM SHAFT SPROCKET

John H. Castoe, 10234 McVine St., Sunland, Calif. 91040

Continuation of Ser. No. 146,470, May 5, 1980, abandoned, which is a division of Ser. No. 871,817, Jan. 24, 1978, Pat. No. 4,218,939. This application Sep. 4, 1981, Ser. No. 299,610

Int. Cl.³ B23P *6/00, 15/00*

U.S. Cl. 29—156.4 R **2 Claims**



1. A method for facilitating removal of an engine cylinder head and for facilitating cranking of the engine when the cylinder head is removed, wherein the engine includes an upper cam shaft sprocket, a lower crankshaft sprocket below the cam shaft sprocket, an endless timing chain engaged with both sprockets and forming a narrow space between opposite sides of the chain adjacent the crankshaft sprocket, and a chain tensioner urged against the portion of the timing chain adjacent the crankshaft sprocket, the method comprising the steps of:

providing a chain support tool having a rigid body, a movable finger in a normal position adjacent a lower portion of the rigid body, and finger actuating means for moving the finger outwardly from the normal position to an operative position enlarging the effective width of the lower portion of the rigid body;

inserting the chain support tool into said narrow space between the opposite sides of the timing chain, with the finger in its normal position, so the rigid body supports the opposite sides of the timing chain adjacent the crankshaft sprocket;

operating the finger actuating means for moving the finger outwardly to its operative position to apply pressure against the normal bias of the chain tensioner for retaining the timing chain on the crankshaft sprocket;

removing the cam shaft sprocket and the engine cylinder head;

providing a cam shaft idler tool having a hub for supporting the cam shaft sprocket, a post for supporting the hub, and means for securing the hub in a selected fixed position on the post;

supporting the cam shaft sprocket on the hub;

securing the post in a fixed position; and

moving the hub to a selected fixed position on the post so the sprocket thereon applies tension to the timing chain, so the engine can be cranked, in the absence of the cylinder head, owing to the tension of the timing chain.

4,373,241

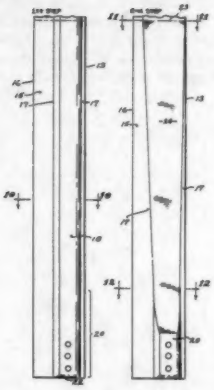
METHOD OF MAKING PROPELLER BLADE

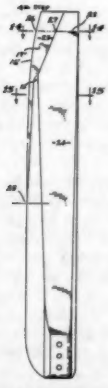
Ralph P. Maloof, 4527 Park Monaco, Calabasa, Calif. 91302

Continuation of Ser. No. 805,283, Jun. 10, 1977, Pat. No. 4,202,655. This application Apr. 28, 1980, Ser. No. 144,389

Int. Cl.³ B23P *15/02*; B21C *23/16*

U.S. Cl. 29—156.8 P **27 Claims**





1. A process for producing a mono-form propeller blade, and which includes:

extruding a basic airfoil of straight elongate and uniform configuration to extend from the root to the tip of the propeller blade and to have front and back cambers extending between rounded and thin leading and trailing edges, respectively:

and truncating the back camber to a flat plane extending from the root to the tip of the propeller blade in tapered relation to the said front camber of the extruded airfoil.

4,373,242

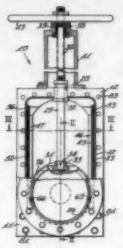
METHOD OF MANUFACTURING A WEDGE GATE VALVE

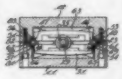
Holliday L. Goldman, Red Lion, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 4, 1978, Ser. No. 948,527

Int. Cl.³ B23P *15/00*; F16K

U.S. Cl. 29—157.1 R **1 Claim**





1. The method of manufacturing a wedge disc valve comprising the steps of:

forming a cavity in each of two identical rectangular pieces of solid steel plate, which cavities define a recess when the two plates are secured together in cavity communicating relationship;

forming an L-shaped groove in two parallel edge surfaces of the portion of each of the steel plates that encompasses the associated cavities therein, the L-shaped grooves in each steel plate cooperating to form two T-slots with the two steel plates in mating relationship;

forming a fluid flow opening in each rectangular piece;

attaching a wedge disc guide bar to the longitudinal edges of the two rectangular pieces to extend into the recess formed by the cavities with the two rectangular pieces mated with both

of the guide bars as T-shaped members with the cross-bar of each T-shaped member being confined within associated ones of the T-slots the stem of the T-shaped guide bars extending through associated T-slots;

forming a peripheral groove in a wedge disc;

locating the wedge disc within the defined recess with its peripheral groove engaged in guideable engagement on the inwardly extending stems of the T-shaped guide bars;

forming an opening in one end of the mated steel plates in which a shaft stuffing box is located with the wedge disc operating shaft extending through the stuffing box;

attaching the shaft to the wedge disc;

forming a seal receiving groove in the edge surface of the portion of the steel plate that encompasses the cavity formed in one of the steel plates, the groove extending from one side of the stuffing box opening to the other;

inserting a resilient seal in the seal receiving groove; and

securing both of the steel plates together in mating relationship with their respective cavities in communicating relationship.

4,373,243

METHOD OF FORMING REINFORCED PLATE-TYPE HEAT EXCHANGER

Masakazu Nakamura, Takarazuka, Japan, assignor to Sumitomo Precision Products Co. Ltd., Amagasaki, Japan

Continuation of Ser. No. 895,026, Apr. 10, 1978, abandoned. This application Mar. 20, 1980, Ser. No. 132,185

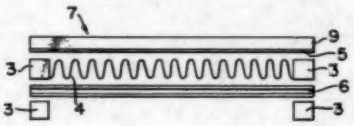
Claims priority, application Japan, Apr. 23, 1977, 52-52093[U]

Int. Cl.³ B23P *15/26*; B23K *31/02*

U.S. Cl. 29—157.3 D **1 Claim**

1. A method for fabricating an aluminum heat exchanger using a fluxless brazing process which consists of:

(a) positioning a first bare aluminum reinforcing member such that one side surface thereof is exposed, said first reinforcing member having a rectangular shape of certain length and width dimensions,
(b) positioning a brazing sheet in contact with the exposed surface of said first reinforcing member, said brazing sheet having a rectangular shape of the same length and width dimensions as said first reinforcing member and consisting of an aluminum plate with brazing material clad to opposite sides thereof,
(c) positioning two identical side bars in contact with said brazing sheet so as to be positioned in parallel along opposite sides of said brazing sheet,
(d) positioning a corrugated aluminum fin means between said side bars and so as to be in contact with the portion of said brazing sheet therebetween,



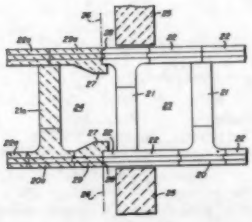
(e) positioning another said brazing sheet in contact with both said side bars and said corrugated fin means, said steps (b), (c), (d) and (e) acting to form a single heat exchanger sub-unit,
(f) repeating steps (b), (c), (d) and (e) to form a multiplicity of additional heat exchanger sub-units against one another,
(g) positioning a second bare aluminum reinforcing member against the final brazing sheet, said second reinforcing member having a rectangular shape of the length and width dimensions as said first reinforcing member, and
(h) evacuating the space around said elements and heating said elements so as to braze together all the elements via a fluxless brazing technique and form the aluminum heat exchanger.

4,373,244

METHOD FOR RENEWING THE BRICKWORK OF COKE OVENS

Walter Mertens; Heinz Thubeauville, and Wilhelm Glittenberg, all of Bochum, Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Oct. 28, 1980, Ser. No. 153,144
Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921171
Int. Cl.³ B23P *7/00*
U.S. Cl. 29—402.08 **2 Claims**



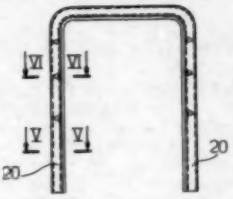
1. A method for renewing the brickwork of vertical heating flues in heating walls near the outer ends of horizontal coke ovens, said method including the steps of forming a vertical section through the heating wall at the innermost internal end of the heating flue requiring repair, removing the brickwork in front of the vertical section, selecting replacement brickwork including oven bricks each having a projecting lug extending from a side thereof, installing the oven bricks with the projecting lugs extending into engagement over existing oven brick on the heating flue side of the heating wall along said vertical section and installing replacement brickwork to form the remaining part of the removed brickwork.

4,373,245

PROCESS FOR MANUFACTURING A METAL SEAT BACK STRUCTURE

Filippo Volpe, Corso Sebastopoli 235, 10100 Torino, Italy

Filed Oct. 7, 1980, Ser. No. 194,825
Claims priority, application Italy, Oct. 10, 1979, 68967 A/79
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—416 **5 Claims**



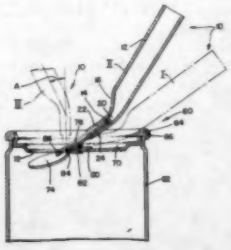
1. A process for manufacturing a metal structure for a seat back for motor vehicles and the like, characterized in comprising the following steps:
(a) shearing at least tow flat L-shaped elements (**12, 14**) from a sheet metal plate (**10**), each element having a long and a short branch wherein the width of each branch of the L-shaped elements is substantially constant and the short branches terminate in flat outer marginal ends;
(b) positioning the outer marginal ends of the short branches of the two L-shaped elements in abutting relationship;
(c) welding together the abutting marginal ends of the short branches of the two L-shaped elements (**12, 14**) to obtain a single, planar U-shaped blank (**16**);
(d) drawing the U-shaped blank (**16**) to form a C-shaped cross-section along its entire length, which cross-section opens outwardly relative to the plane of said U-shaped blank, obtaining a structure usable as a frame for the back of a seat of motor vehicles and the like.

4,373,246

METHOD OF OPENING A CAN WITH FULCRUM-TYPE OPENER TABS

Arthur C. VanHoutte, 24743 Murray Dr., and Earl L. Caber, 24744 Murray Dr., both of Mt. Clemens, Mich. 48045

Filed Jun. 2, 1980, Ser. No. 155,204
Int. Cl.³ B67B *7/40*
U.S. Cl. 29—426.4 **1 Claim**



1. A method of providing leverage in the opening of a bever-

age containing can employing a fulcrum-type opener characterized by a peripherally weakened closure member integrally formed in the top of said can and a key portion which effects rupture opening of a contents dispensing aperture within said top about the periphery of said closure member and remains permanently affixed thereto after said opening, said key portion initially being disposed substantially parallel to and spaced slightly above a substantially horizontal planar portion of said top, said method comprising the steps of:

grasping an elongated handle of an improved hand held opener in the hand of an operator so that one end of said handle projects outwardly therefrom;

orienting the can to be opened so that an upwardly depending edge portion defined thereby, which circumferentially encompasses said fulcrum-type opener and extends substantially above said key portion, projects substantially upwardly;

securing said can from inadvertent displacement during the opening thereof to avoid spilling the beverage contained therein;

maneuvering said hand held opener with respect to said can so that tab embracing means, depending from said extending handle and defining a key portion receiving recess therein opening outwardly from said handle and having an axis of symmetry acutely angularly offset from the axis of elongation of said handle, is simultaneously guided generally downwardly and inwardly toward said fulcrum-type opener, whereby said hand-held opener avoids interference with said upwardly depending edge portion and said key portion is matingly received within said key portion receiving recess in a single, continuous motion to effect mechanical linkage between said hand-held opener and said key portion, said axis of symmetry being substantially parallel to said horizontal planar portion of said top immediately prior to and during said mechanical linkage;

angularly displacing said hand-held opener to rotate said key portion from a first, stowed position to a second, load bearing position about a point of connection between said key portion and said top to effect said opening;

reciprocally displacing said hand-held opener to rotationally return said key portion to said stowed position wherein said key portion does not interfere with dispensing of said beverage through said opening; and

demating said key portion and said hand-held opener by further maneuvering said hand-held opener generally outwardly and upwardly in a single, continuous motion, from said can to again avoid interference with said edge portion.

4,373,247

METHOD AND DEVICE FOR REMOVING A RING TRAVELLER FROM THE RING OF A RING-SPINNING OR RING-TWISTING FRAME

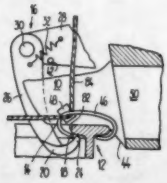
Ernst Holenstein, and Paul Ramseier, both of Pfäffikon, Switzerland, assignors to Bräcker AG, Pfäffikon, Switzerland

Filed Aug. 28, 1980, Ser. No. 182,465

Claims priority, application Switzerland, Sep. 14, 1979, 8330/79

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—426.6 **9 Claims**



1. A method of removing a ring traveller from the ring of a ring-spinning or ring-twisting frame, comprising the steps of:

positioning a removal member relative to a ring traveller located on the ring;

manipulating the removal member so as to force one end of the ring traveller over an adjacent edge of a flange of the ring while the other end of the ring traveller is still in engagement with another flange of the ring, in order to thereby expand the ring traveller against its own spring tension;

releasing said one end of the ring traveller after it has cleared said adjacent edge of the ring, so that the ring traveller springs-off the ring in the direction of a collecting device; and

retaining the released ring traveller in the collecting device after such ring traveller has sprung-off the ring.

4,373,248

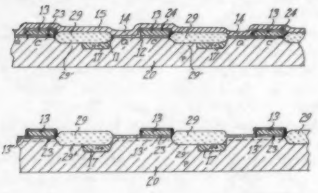
METHOD OF MAKING HIGH DENSITY SEMICONDUCTOR DEVICE SUCH AS FLOATING GATE ELECTRICALLY PROGRAMMABLE ROM OR THE LIKE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 923,876, Jul. 12, 1978, Pat. No. 4,184,207, which is a division of Ser. No. 762,613, Jan. 26, 1977, Pat. No. 4,151,021. This application Jan. 7, 1980, Ser. No. 110,052

Int. Cl.³ H01L *21/225, 21/26, 21/265*

U.S. Cl. 29—571 **22 Claims**



1. A method of making an electrically programmable floating gate nonvolatile semiconductor memory in the form of an array of rows and columns of memory cells, comprising the steps of: applying successive coatings of oxide, polycrystalline silicon and an oxidation mask to a face of a silicon body; patterning said coating of oxidation mask to provide a plurality of parallel strips; oxidizing the face of the silicon body to produce field oxide in the areas between said parallel strips of oxidation mask, the field oxide being thicker than said oxide coating; depositing a second conductive layer on said face insulated therefrom by an oxide coating; patterning said layer to provide a second plurality of parallel strips; said second plurality of parallel strips providing row lines and being perpendicular to elongated column lines in the face.

4,373,249

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasunobu Kosa, and Kazuhiro Komori, both of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,739

Claims priority, application Japan, Feb. 20, 1980, 55-18983

Int. Cl.³ H01L *21/26*

U.S. Cl. 29—571 **7 Claims**

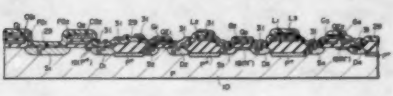
1. A method of a fabricating a semiconductor integrated circuit device comprising the steps of:

simultaneously forming first and second gate insulation films at one part and another part of the main surface of a first conductivity type semiconductor substrate, respectively;

forming a conductor layer on said first and second gate insulation films and patterning said conductor layer thereby to form first and second gate electrodes;

forming an insulation film on said first gate electrode;

forming a third gate electrode on said insulation film of said first gate electrode; and



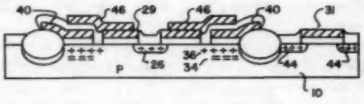
introducing into said substrate an impurity which determines a second conductivity type exhibiting the opposite conductivity to said first conductivity type thereby to form source and drain regions.

4,373,250

PROCESS FOR FABRICATING A HIGH CAPACITY MEMORY CELL

Manohar L. Malwah, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Nov. 17, 1980, Ser. No. 207,264
Int. Cl.³ H01L *21/26*
U.S. Cl. 29—571 **8 Claims**



1. A method of fabricating an array of high capacity memory cells, comprising:

(a) forming isolation regions in a surface of a semiconductor substrate which are patterned to form a multiplicity of cell areas;

(b) forming a pattern of conductive material over said semiconductor surface insulated therefrom to form a transfer gate over each cell area spaced from an adjacent isolation region and to define a storage region in said semiconductor surface adjacent to one side of said transfer gate between said transfer gate and said adjacent isolation region and also to define a bit line region on the other side of said transfer gate;

(c) introducing ions having majority carriers of first conductivity type in said storage region to form a shallow ion layer therein self-aligned with said transfer gate;

(d) introducing ions having majority carriers of second conductivity type opposite said first conductivity type in said storage region to form a deep ion layer beneath said shallow ion layer self-aligned with said transfer gate;

(e) forming a storage gate of conductive material over a portion of said storage region and spaced laterally from said transfer gate to form a gap between said storage and transfer gates; and

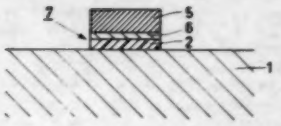
(f) introducing ions having majority carriers of said first conductivity type into the portion of said storage region defined by said gap and into said bit line region to at least neutralize some of the ions in said deep ion layer and also to produce a bit line which may serve as the source region of a transistor.

4,373,251

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Hermanus J. H. Wilting, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,268
Claims priority, application Netherlands, Aug. 27, 1980, 8004835
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **6 Claims**



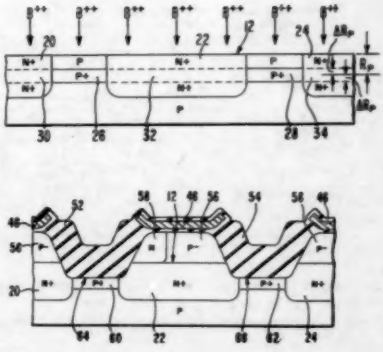
1. A method of manufacturing a semiconductor device, including the steps of providing an electrically insulating layer on a surface of a semiconductor body, providing a polysilicon layer on the insulating layer which polysilicon layer is made electrically conductive by the introduction of a dopant, providing a metal layer on the polysilicon layer, and subjecting the metal layer together with the polysilicon layer to a thermal treatment in which the polysilicon layer is converted over a part of its thickness into a metal silicide layer by reaction with the metal of the metal layer, characterized in that, after converting the polysilicon layer over a part of its thickness into the metal silicide layer, the dopant is introduced through the metal silicide layer into the remaining part of the polysilicon layer.

4,373,252

METHOD FOR MANUFACTURING A SEMICONDUCTOR STRUCTURE HAVING REDUCED LATERAL SPACING BETWEEN BURIED REGIONS

Robert E. Caldwell, Mountain View, Calif., assignor to Fairchild Camera & Instrument, Mountain View, Calif.

Filed Feb. 17, 1981, Ser. No. 234,289
Int. Cl.³ H07L *21/263;* H01L *27/04*
U.S. Cl. 29—576 B **6 Claims**



1. In a process for fabricating a semiconductor structure, a method for reducing the lateral spacing between buried regions, the method comprising the steps of:

providing a semiconductor substrate of a first conductivity type having an electrically insulating layer along an upper surface of the substrate;

forming two laterally spaced apart holes through the insulating layer to the upper surface of the substrate;

introducing a semiconductor dopant of a second conductivity type opposite to the first conductivity type through the holes in the insulating layer into the substrate to form two laterally spaced apart doped regions of the second conductivity type in the substrate;

removing the remainder of the insulating layer;

implanting ions of a chemical species of the first conductivity type into the upper surface of the substrate at a selected dosage;

forming an epitaxial layer on the upper surface of the substrate;

forming a groove in a portion of the epitaxial layer overlying that portion of the substrate between the doped regions of the substrate; and

exposing the surface of the epitaxial layer exposed by the groove to a selected oxidizing environment to form an electrically insulating oxidized region which extends down into a portion of the substrate between the doped regions

wherein ions of the chemical species implanted into the surface of the substrate diffuse downwardly during the exposing step to define a more highly doped region of the first conductivity type between the doped regions and adjacent to the oxidized regions, the more highly doped region having a net dopant concentration greater than the net dopant concentration of an adjacent portion of the first conductivity type of the substrate and the selected dosage being sufficiently high such that no inversion into a doped region of the second conductivity type occurs in the more highly doped region, whereby the more highly doped and oxidized regions in combination electrically isolate the doped regions from each other.

4,373,253

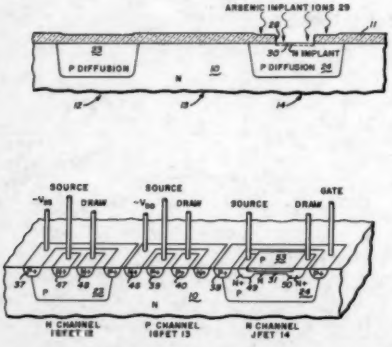
INTEGRATED CMOS PROCESS WITH JFET

Wadie N. Khadder, Sunnyvale; Jia-Tarng Wang, San Jose, and James E. Solomon, Cupertino, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 13, 1981, Ser. No. 253,470

Int. Cl.³ H01L *27/04, 21/263, 21/22*

U.S. Cl. 29—576 B **8 Claims**



1. In a CMOS integrated circuit wafer treatment process, the additional steps for creating a JFET comprising:

starting with a semiconductor wafer of a first conductivity type;

establishing an opposite conductivity type well in said wafer with said well having a resistivity suitable for a JFET gate;

creating spaced apart source and drain regions of said first conductivity type in said well;

creating a channel region having said first conductivity type joining said source and drain regions;

ion implanting an impurity of said opposite conductivity type having a different diffusity rate from the impurity in said channel to form an overlapping top cap over said channel to locate said channel below the surface of said wafer and whereby said top cap is connected to said well;

applying operating potentials to said JFET;

measuring the pinch off voltage of said JFET channel; and

heat treating said wafer to shift said pinch off voltage.

4,373,254

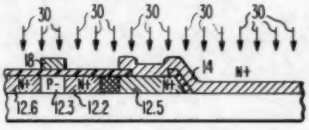
METHOD OF FABRICATING BURIED CONTACTS

Martin A. Blumenfeld, Tequesta, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,075

Int. Cl.³ H01L *21/26*

U.S. Cl. 29—578 **6 Claims**



1. A process for forming low resistance, ohmic contacts to a semiconductor body of a given conductivity type, the body having a layer of insulating material thereon, comprising the steps of:

masking the semiconductor body to delineate an area within which the ohmic contact is to be formed, the delineated area being larger than the area of the ohmic contact;

doping only the delineated area of the semiconductor body under the delineated area to an opposite conductivity type;

removing a portion of the layer of insulating material in the delineated area to expose a portion of the underlying semiconductor body; and

providing a conductive ohmic contact to the exposed portion of the semiconductor body.

4,373,255

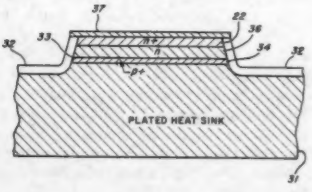
METHOD OF MAKING OXIDE PASSIVATED MESA EPITAXIAL DIODES WITH INTEGRAL PLATED HEAT SINK

Herbert Goronkin, Scottsdale, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 50,272, Jun. 19, 1979, Pat. No. 4,340,900. This application Jun. 3, 1981, Ser. No. 270,050

Int. Cl.³ H01L *29/06, 29/90*

U.S. Cl. 29—580 **5 Claims**



5. A method of making a silicon epitaxial diode comprising the steps of:

a. forming a silicon substrate having a heavily doped layer and a lightly doped layer, both layers being of the first conductivity type;

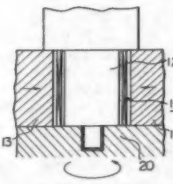
b. thermally growing a layer of SiO_2 on the lightly doped layer;
c. depositing a first temporary support layer on the SiO_2 in step b;
d. thermally growing a layer of SiO_2 on the heavily doped layer;
e. depositing a layer of Si_3N_4 over the SiO_2 in step d;
f. defining a diode pattern on the Si_3N_4 layer;
g. etching through the Si_3N_4 and the SiO_2 layers in the region outside the diode pattern;
h. etching through the lightly and heavily doped layers of silicon to form a mesa-like structure;
i. thermally growing a layer of SiO_2 on the sidewalls of the mesa-like structure;
j. depositing a second temporary support layer on the SiO_2 in step i;
k. removing the first temporary support layer;
l. etching the SiO_2 from step b to expose the lightly doped layer;
m. introducing dopant of the second conductivity type, opposite the first conductivity type, into the lightly doped layers so as to form a pn junction;
n. plating a thick layer of thermally and electrically conductive material on the area doped in step m;
o. removing the second temporary support layer;
p. etching away the Si_3N_4 over the diode pattern;
q. etching the SiO_2 from the surface of the heavily doped layer; and
r. depositing a layer of electrically conductive material on the surface of the heavily doped layer.

4,373,256

METHOD OF MAKING ROTOR COIL OF CORELESS MOTOR

Yoshimitsu Nakamura, Settsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 904,866, May 11, 1978, Pat. No. 4,236,295. This application Oct. 8, 1980, Ser. No. 195,054
Claims priority, application Japan, May 18, 1977, 52-57873
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 **2 Claims**



1. In a method of making a cylindrical rotor coil for use in a coreless electric motor, wherein a substantially cylindrical coil is formed from an insulation coated conductive wire by diagonally folding back the wire at respective axial and edge portions of a cylindrical shape to sequentially form respective inner and outer coil layer turns running diagonally from one end edge to the other while intersecting at an angle the other layer turn, the improvement wherein said coil is compacted by the steps of:

positioning within said coil is mandrel having an outer diameter smaller than an inner diameter of said coil, and

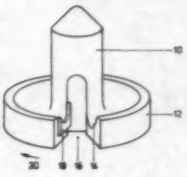
applying pressure to said coil in radial inward directions against an outer periphery of said coil while maintaining flat rigid die surfaces in abutting relationship with both axial ends of said coil, to generally flatten the portions of said wire defining inner and outer peripheries of said coil and to radially inwardly compress together the turns of said coil against said mandrel for reducing the radial thickness of said coil and reducing the inner and outer diameters of said coil.

4,373,257

PROCESS AND DEVICE FOR FORMING THE WINDING CORES OF STATORS OR ROTORS OF ELECTRIC MACHINES

Josef Müller, Frankfurt am Main, Fed. Rep. of Germany, assignor to Balzer & Droll, KG, Niederdorfelden, Fed. Rep. of Germany

Division of Ser. No. 49,305, Jun. 18, 1979, Pat. No. 4,327,478. This application Jul. 28, 1980, Ser. No. 173,066
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827139
Int. Cl.³ H02K *15/00*
U.S. Cl. 29—736 **16 Claims**



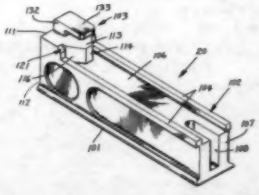
1. A device for shaping and lacing the winding head of a stator or rotor of an electrical machine comprising a shaping tool including a shaping part for shaping a said winding head of a stator or rotor, means for rotating said shaping tool relative to the longitudinal axis of the stator or rotor, and lacing tool means for lacing said winding head simultaneously with said shaping of said winding head, said shaping tool being disposed immediately adjacent to said lacing tool means and being progressively movable with the lacing tool means around the circumference of the winding head.

4,373,258

TOOL FOR REMOVING COVER FROM ELECTRICAL CONNECTOR

Erle M. Hutchins, Bel Air, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,662
Int. Cl.³ B23P *19/00*; **H01R** *43/00*
U.S. Cl. 29—764 **11 Claims**



1. A tool for removing a cover from an electrical connector to which it is secured by a locking arrangement between the connector and depending portions of sidewalls of the cover at one end of the connector, said tool comprising:

a prong which is adapted to be inserted into a cavity of the connector;

camming means aligned with the one end of the connector when said prong is inserted into the cavity for engaging the cover at the one end of the connector and for spreading apart the depending portions of the sidewalls of the cover to disengage the depending portions from the connector; and

separating means rendered effective by the spreading apart of the depending portions of the cover for causing the cover to be moved away from the one end of the connector.

4,373,259

PROCESS FOR MOUNTING COMPONENTS WITH SURFACE JUNCTIONS TO PRINTED-CIRCUIT BOARDS

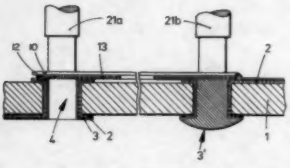
Hans Motsch, Geislingen, Fed. Rep. of Germany, assignor to Württembergische Metallwarenfabrik, Geislingen, Fed. Rep. of Germany

Filed Dec. 5, 1979, Ser. No. 100,354

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852753

Int. Cl.³ H05K *3/34*

U.S. Cl. 29—840 **15 Claims**



1. A process for connecting flat film-like components to a printed circuit board, wherein said components include electrically-conductive junctions, said process comprising the steps of:

providing said printed circuit board with through-plated holes whose plating includes fusible material and extends to contacts on said printed board, where said junctions are to be placed on said printed circuit board;

positioning said components on said board with said junctions touching said contacts but not extending into said through-plated holes; and

contacting said printed circuit board, on a side thereof opposite said components, with liquid solder which rises in said through-plated holes thereby heating the plating therein and said junctions to form a bond between said printed circuit board and said components at said contacts.

4,373,260

ELECTRICAL CIRCUIT WIRING ARRANGEMENT AND ITS SOLDERING METHOD

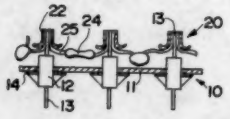
Kazuaki Matsumura, Ohtsu, and Seiki Nakanishi, Ohmihachiman, both of Japan, assignors to New Nippon Electric Company, Ltd., Osaka, Japan

Filed Aug. 7, 1980, Ser. No. 175,960

Claims priority, application Japan, Aug. 11, 1979, 54-102519

Int. Cl.³ H05K *3/34*

U.S. Cl. 29—840 **5 Claims**



1. A method of manufacturing an electrical circuit wiring on metal board means for supporting a plurality of first circuit elements with hard leads, a plurality of second circuit elements with soft leads, and a plurality of eyelet terminals of conductive material for receiving said hard leads and said soft leads, by forming soldered junctions for connecting said first circuit elements and said second circuit elements to each other, comprising the following steps:

assembling said first circuit elements on said metal board means, locating each of said eyelet terminals in a predetermined respective hole formed on an unsolderable supporting mounting tool, mounting said second circuit elements on said mounting tool by inserting each of said soft leads into a respective one of said eyelet terminals, inserting each of said hard leads of said first circuit elements also into a respective one of said eyelet terminals, applying molten solder to portions of said hard leads and of said soft leads extending out of said eyelet terminals so as to connect electrically and mechanically said first and second circuit elements at soldered junctions formed by said eyelet terminals; and removing said mounting tool from said soldered first and second circuit elements by passing said soldered junctions with the eyelets through said holes.

4,373,261

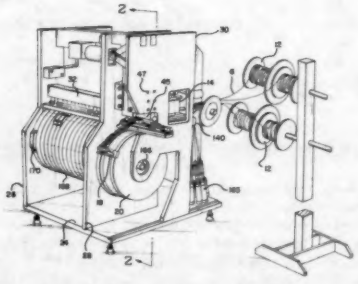
METHOD AND APPARATUS FOR MANUFACTURING ELECTRICAL HARNESSES

Alden O. Long, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 4, 1980, Ser. No. 183,861

Int. Cl.³ H01R *43/04*; B23P *19/00*

U.S. Cl. 29—861 **13 Claims**



1. Apparatus for serially manufacturing electrical harness means of the type comprising at least one electrical connector, said connector having contact terminals therein of the type having wire-receiving portions, said harness means having wires connected to, and extending from, said terminals, said apparatus being of the type comprising a wire insertion zone, connector locating means for locating a connector in a predetermined position in said insertion zone, wire feeding means for feeding wires in side-by-side parallel relationship from endless wire sources, such as spools, along a first path to position said wires in alignment with terminals in a connector in said connector locating means, and wire insertion means movable along a second path towards and away from said connector in said locating means, the improvements to said apparatus comprising:

connector moving means for moving said connector from said connector locating means along a continuation of said first path away from said insertion zone,

first wire-cutting means on said first path, said first wirecutting means being located between said connector-locating means and said first wire sources, said first wire-cutting means comprising individual sets of cutters for each of said wires, and

actuating means effective to actuate said feeding means thereby to feed the leading ends of said wires to said insertion zone, to thereafter actuate said wire insertion means to insert said leading ends of said wires into said terminal of said connector in said connector-locating means, to thereafter actuate said connector moving means to move said connector from said insertion zone and thereby withdraw wire from said wire sources, and said actuating means being effective selectively to actuate said

individual wire cutters during movement of said connector to produce wires of predetermined lengths extending from said connector.

10. A method of serially manufacturing electrical harness means of the type comprising at least one electrical connector, said connector having contact terminals therein of the type having wire-receiving portions, and harness means having wires connected to, and extending from, said terminals, said wires having free ends which are remote from said connector, said method comprising the steps of:

(a) locating one of said connectors in a wire insertion station,

(b) positioning the leading ends of wires which extend from substantially endless wire sources, such as spools, in alignment with the terminals in a said connector at said insertion station and inserting said leading ends into said terminals,

(c) moving said connector along a predetermined path away from said insertion station and away from said wire sources and thereby pulling wire from said wire sources,

(d) cutting said wires during movement of said connector along said path at a fixed location between said insertion station and said wire sources and thereby producing one of said harness assemblies,

(e) repetitively carrying out steps (a) to (d) as set forth above to produce said harness means serially.

4,373,262

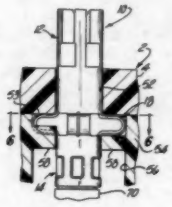
ELECTRICAL CONTACT WITH LOCKING DEVICE

Roland F. Blakesley, Canton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 74,637, Sep. 12, 1979, Pat. No. 4,278,313. This application Sep. 2, 1980, Ser. No. 183,549

Int. Cl.³ H01R 43/04

U.S. Cl. 29—882 **1 Claim**



1. A method of making an electrical connector assembly of the type including a dielectric housing having a passage therethrough for receiving a hermaphroditic electrical contact comprised of a tubular body, the steps including:

providing a plurality of radially spaced, longitudinally extending engagement fingers on a forward end portion of the tubular body, each finger including at its distal end portion an offset blade portion;

bending said offset blade portions radially inwardly so that ends converge towards but do not reach the central axis of the tubular body;

forming generally U-shaped locking shoulders medially around the tubular body, said shoulders cooperating to allow said tubular body to undergo longitudinal compression;

forming a number of retention shoulders on said dielectric housing for mounting the contact within the passage, each adjacent pair of retention shoulders being separated by a slot and the number of retention shoulders being equal in number to the number of locking shoulders, each retention shoulder being formed with a tapered entry ramp leading to a groove sized to receive one said locking shoulder;

fitting the tubular body into the passage so that the locking shoulders fit between the slots and are disposed adjacent to the entry ramps; and

twisting the body so that the locking shoulder is forced up the ramp and into the groove.

4,373,263

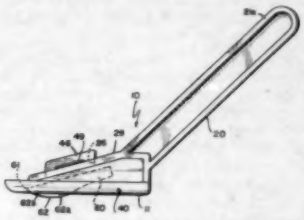
MOLDED IMPLANT REMOVAL KNIFE

Grover W. Ayers, Vinton, Va., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 17, 1980, Ser. No. 217,448

Int. Cl.³ B26B 29/00

U.S. Cl. 30—294 **3 Claims**



1. An implant removal knife including two pieces adapted for manufacture by molding and for assembly without fasteners, comprising

a molded unitary first piece forming a handle portion and an integral blade-carrying portion extending forwardly from the handle portion at an obtuse angle, said handle portion and blade-carrying portion including a central web and a pair of ribs, said pair of ribs extending outwardly on each side of the central web at the periphery of the handle portion and extending forwardly at an obtuse angle to form an upper planar surface over the blade-carrying portion, one of the ribs at one side of the central web portion of the blade-carrying portion having a central slot to provide a resilient rib portion, said blade-carrying portion further including a flange depending downwardly from the planar surface and forming a straight lower edge intersecting the axis of the handle at an acute angle, and

a molded second piece engaging the blade when assembled to the first piece, said second piece including an upwardly projecting surface having a thickness about equal to the width of the central slot in the blade-carrying portion of the first piece and having a snap rib, an interior surface shaped to engage the blade and a flange depending downwardly and parallel to the interior surface and forming a straight lower edge,

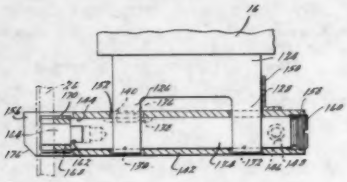
said second piece being assembled to said first piece with upwardly extending surface of the second piece inserted into the central slot of the first piece, said snap rib having passed the resilient rib portion of the first piece so that the resilient rib portion retains the second piece to the first piece with the snap rib above the planar surface and so that the lower edge of the downwardly depending flange of the second piece is parallel to the lower edge of the downwardly depending flange of the first piece and so that said lower edges form a pair of parallel edges spaced outwardly from the central web of the blade-carrying portion and interior surface of the second piece, and whereby upon assembly a blade may be retained between said two pieces and held at an obtuse angle with respect to said handle and at an acute angle with respect to the spaced lower edges of the downwardly depending flanges of the first and second pieces.

4,373,264

INERTIAL GUIDE AND SUPPORT MEANS FOR SABRE SAWS

John D. Hamaker, 112 S. Nelson, Potterville, Mich. 48876

Filed Jan. 7, 1981, Ser. No. 223,046
Int. Cl.³ B27B *19/09*
U.S. Cl. 30—374 **15 Claims**



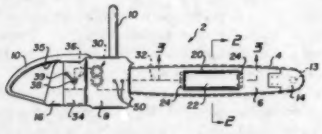
1. An inertial guide and support means for a sabre saw having a housing and a reciprocal saw blade carried by said housing, said inertial guide and support means comprising a relatively heavy base, means attaching said base to said housing, and a guide member associated with said base and bearing against said blade whereby said guide member guides said blade and substantially prevents deflection thereof while transmitting the inertial force of said base to said blade and the reaction of said blade to said base, the portion of said base adjacent said blade being chamfered.

4,373,265

MODIFIED CHAIN SAW

Gerardus van Halderen, P.O. Box 4237, Quesnel, British Columbia, Canada (V2J 3J3)

Filed Mar. 13, 1981, Ser. No. 243,635
Int. Cl.³ B27B *17/02*
U.S. Cl. 30—383 **11 Claims**



1. In a chain saw having a motor, a cutting chain and a guide bar for the chain the improvement comprising an opening formed in the guide bar;

a flexible bladder positioned in the opening and located on the guide bar;

means permitting access to the bladder to insert fluid into the bladder so that the bladder may be expanded.

4,373,266

EQUIPMENT FOR CONTINUOUSLY MEASURING THE LENGTH OF AN ENDLESS MATERIAL BEING WOUND UP INTO A CIRCULAR PACKAGE

Hansruedi Stutz, Dietlikon, Switzerland, assignor to Loepfe Brothers Limited, Zürich, Switzerland

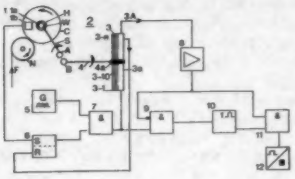
Filed Oct. 20, 1980, Ser. No. 313,208
Claims priority, application Switzerland, Nov. 5, 1980, 8212/80
Int. Cl.³ G01B *19/04*
U.S. Cl. 33—129 **1 Claim**

1. Equipment for continuously measuring the length of endless material which is being wound-up upon a rotating core into a circular package upon a winding machine which comprises a movable member whose position depends on the diameter of the circular package, wherein the measuring equipment comprises:

a movable transfer member mechanically coupled to the movable member of the winding machine and provided with three parallel rows of position markers staggered relative to each other in longitudinal direction of the rows;

stationary transducer means for sensing the position of the transfer member without contacting the same and producing sensing signals during each revolution of the package dependent upon the diameter thereof;

said stationary transducer means comprising three photoelectrical sensors each cooperating with one of the parallel rows of position markers;



a cycle signal generator producing a cycle signal during each revolution of the package for controlling the delivery of the sensing signals;

counting pulse generating means for generating a continuous series of counting pulses independent of the position of the transfer member;

circuitry for generating a digital length measuring signal from the counting pulses and sensing signals occurring upon each cycle signal; and

means for summing up consecutive digital length measuring signals.

4,373,267

GAUGE CALIBRATION BLOCK

Goodwin A. Lycan, P.O. Box 23, Stevensville, Mich. 49127

Filed Jul. 13, 1981, Ser. No. 282,526
Int. Cl.³ G01B *3/30*
U.S. Cl. 33—168 R **3 Claims**

1. In a block for calibrating an offset gauge having longitudinally displaceable bar members having oppositely extending contacts, said block having a top face, and a bottom face, graduated steps in said top face and a longitudinal opening extending through said block from said top face to said bottom face at said steps, said opening constituting means through which said gauge is fitted with said contacts thereof contacting said steps to displace said bar members, the improvement comprising: an arm member pivotally connected to said block and including a side face, said arm member having an inoperative position wherein said arm member extends outwardly from said block, and an operative position wherein said arm member side face forms a selected angle with said block bottom face and therein when in said operative position constitutes means for contacting said gauge to position said gauge within said block opening.

4,373,268

GEAR MEASURING MACHINE FOR INSPECTING HELICAL GEARS

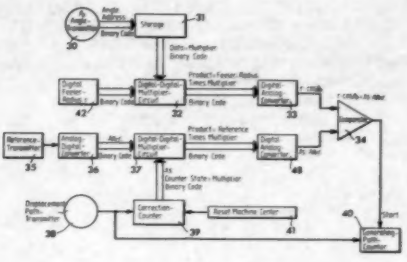
Hans Speeth, Kloten, Switzerland, assignor to Maag Gear-Wheel & Machine Company Ltd., Zürich, Switzerland

Filed Dec. 8, 1981, Ser. No. 328,750

Claims priority, application Switzerland, Dec. 23, 1980, 9546/80

Int. Cl.³ G01B 5/20, 7/28

U.S. Cl. 33—179.5 R 5 Claims



1. A gear measuring machine for inspecting the gear teeth of helical gears, comprising:

a feeler having a feeler tip;

a radius transmitter;

an angle transmitter;

a storage connected with said angle transmitter and serving for the storage of trigonometric angle functions;

said angle transmitter delivering to said storage binary coded addresses corresponding to a set helix angle;

said storage for trigonometric functions delivering output data constituting a binary coded first multiplier indicating the helix angle of the gear tooth;

a first digital-digital multiplier circuit to which there is delivered said multiplier;

said digital-digital multiplier circuit multiplying said binary coded multiplier with a binary coded value of the feeler tip radius and delivering an output signal;

said radius transmitter delivering said binary coded value of the feeler tip radius to said digital-digital multiplier circuit;

a comparator having a first input and a second input;

a first D/A-converter connected with said comparator;

the output signal of said first digital-digital multiplier circuit being applied to the first input of said comparator by means of said first D/A-converter;

a correction counter;

a second digital-digital multiplier circuit having a first input;

a displacement path transmitter for delivering a binary coded value to the first input of said second digital-digital multiplier by means of said correction counter;

said binary coded value of the displacement path transmitter being counted in steps from the center of the machine;

said second digital-digital multiplier circuit having a second input at which there are received binary coded reference values;

said reference values constituting the quotient of the product delivered by the first digital-digital multiplier circuit and the steps;

said second digital-digital multiplier circuit forming the product of said steps and said reference values;

a second D/A converter;

said second digital-digital multiplier circuit supplying said product to said second input of said comparator by means of said second D/A-converter; and

a generating path counter;

said comparator, upon receiving two essentially equal input signals, delivering an output signal for starting said generating path counter.

4,373,269

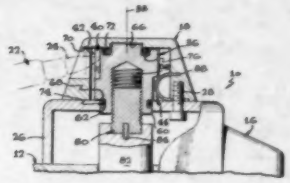
ADJUSTMENT MECHANISM

Darrel L. Doliber, and O'Dell M. Keil, both of Tempe, Ariz., assignors to Litton Systems Inc., Beverly Hills, Calif.

Filed Nov. 3, 1980, Ser. No. 202,911

Int. Cl.³ F41G 1/38

U.S. Cl. 33—246 13 Claims



1. An adjustment assembly particularly suitable for actuation by a lever, comprising:

(a) a housing member;

(b) a cap member connected to said housing member;

(c) rotatable drive means constrained between said cap member and said housing member, said drive means capable of being selectively rotated by said lever;

(d) a limited access aperture in said cap member sized to permit insertion of said lever into said cap member for rotation of said drive means; and

(e) non-rotatable driven means engaged by said drive means, said driven means exhibiting movement substantially parallel to the axis of rotation of said drive means when said drive means is rotated.

4,373,270

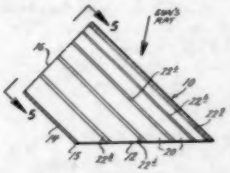
SUNDIAL

Russell M. Ousley, 3640 Santiago Dr., Florissant, Mo. 63033

Filed Jun. 3, 1981, Ser. No. 269,909

Int. Cl.³ G04B 49/00

U.S. Cl. 33—270 5 Claims



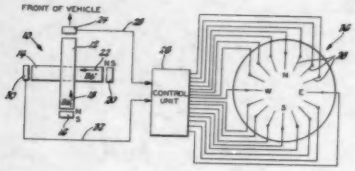
1. A sundial, comprising a translucent body member having a semi-cylindrical surface with a plurality of relatively clear, light-transmitting, spaced narrow flat surfaces thereon separated by relatively dark surfaces, the flat surfaces being spaced apart one from another around the semi-cylindrical surface by a predetermined distance representing a chosen time interval in travel of sunlight across the earth from east to west, a diametric surface on the member with an index marked thereon parallel to the cylindrical axis of the semi-cylindrical surface, the body member being adapted to be disposed in sunlight with its cylindrical axis at least approximately parallel to the earth's axis, so that the beam transmitted through the flat surface that ends nearest the index represents the apparent time.

4,373,271

SOLID STATE COMPASS

Larry T. Nitz, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1980, Ser. No. 215,268
Int. Cl.³ G01C *17/30*
U.S. Cl. 33—361 **3 Claims**



1. A motor vehicle compass comprising:

perpendicularly oriented ferromagnetic core members mounted in a predetermined relationship with respect to the heading of said vehicle;

sensing means associated with each of said core members for providing an electrical signal determined as a function of the magnetic field strength therein, the magnetic field strength in said core members varying as a function of the orientation of said core members relative to the earth's magnetic field;

means responsive to said sensing means for summing said electrical signals to form a composite field intensity signal;

means responsive to the relative magnitudes of said electrical signals and to the amplitude of said composite signal for developing a direction signal indicative of the heading of the vehicle; and

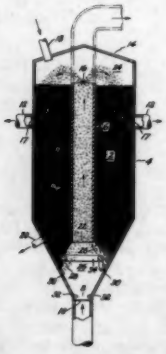
means responsive to said direction signal for visually displaying the heading of the vehicle.

4,373,272

SYSTEM FOR CONTROLLING SPOUTED BED INLET CONDITIONS

Thomas B. Jones, Fort Collins, Colo.; Morris H. Morgan, Clifton Park, and Peter W. Dietz, Delanson, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1980, Ser. No. 190,816
The portion of the term of this patent subsequent to Sep. 21, 1999, has been disclaimed.
Int. Cl.³ F26B *17/00*
U.S. Cl. 34—57 A **14 Claims**



1. A spouted bed device comprising;

a vessel for containing semi-insulating granular material which vessel includes a fluid inlet disposed in a vertically lower section thereof;

a tubular member having an inlet located within the vessel vertically above and in flow communication with the vessel fluid inlet; and

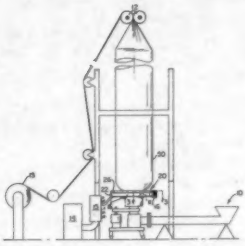
means for forming an electric field within the vessel which field impinges upon the tubular member inlet.

4,373,273

AIR RING HAVING A CIRCULAR ARRAY OF A LARGE MULTIPLICITY OF SUBSTANTIALLY PARALLEL CELL-LIKE PASSAGES IN THE AIR FLOW PATH LEADING TO THE OUTLET

Robert Church, Bartlett, N.H., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Apr. 13, 1981, Ser. No. 253,549
Int. Cl.³ F26B *19/00*; B29D *7/20*
U.S. Cl. 34—104 **7 Claims**



1. In an air ring of the type mounted concentrically about a moving extruded tube of plastic at a point close to where the plastic emerges from an annular die,

the air ring having a circular entry plenum fed by generally tangential inlet conduit means and means to guide the air inwardly toward the surface of the tube,

the flow of air in said plenum having a circumferential component of velocity attributable to the swirling flow in said plenum,

said air ring having at least one outlet adjacent the surface of the tube for discharging air in a desired direction for exposure of the cooling air to the tube surface, and

the air ring having at least one internal device lying inwardly of said plenum for modifying the air flow to make the flow more uniform before it reaches said outlet,

the improvement wherein said internal device comprises a circular array of a large multiplicity of substantially parallel, generally radial, convergently arranged, centrally directed, cell-like passages in the air flow path leading inwardly to said outlet,

the individual cell-like passages having orthogonal lateral dimensions (X and Y directions) transverse to the local radial direction of flow (Z direction) less than about one-half the air flow length (Z dimension) of said passages, and being adapted to divide said air flow path leading to said outlet into a multiplicity of individual cell-like flow paths,

the aggregate cross-sectional flow area presented by said array of cell-like passages comprising at least 80% of the inlet surface of said internal device, said air ring adapted to deliver a general air flow to said array containing a circumferential component of motion, and

said array adapted to receive said general flow of air and to divide said flow momentarily into a multiplicity of discrete, parallel, radially oriented, centrally directed small streams separated from each other in both X and Y coordinates, and to cause said streams to subsequently merge into a second generally radial, convergently directed flow toward the surface of said plastic tube,

the momentary division of said general flow by said array

into said multiplicity of streams being effective to eliminate said circumferential component of velocity in said air flow and to orient the direction of flow of said air and remove major turbulences and vortices in both X and Y coordinates with relatively little pressure drop occurring across said internal device.

4,373,274

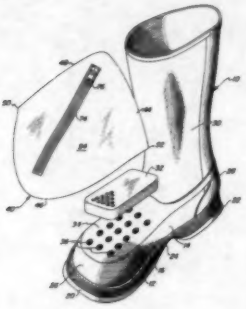
ENCLOSURE ARRANGEMENT FOR WARMED FOOTWEAR

William J. Michalski, P.O. Box 18, Bloomingdale, N.J. 07403

Filed Feb. 20, 1981, Ser. No. 236,204

Int. Cl.³ A43B 7/02

U.S. Cl. 36—2.6 **22 Claims**



1. An enclosure arrangement for use in connection with a boot whereby a booted foot will be warmed selectively by a warming device, the boot having a longitudinally extending sole and an upper extending altitudinally from a welt area at the intersection of the sole and the upper, the sole including a toe end, a heel end and a shank between the toe end and heel end, and the upper including a toe adjacent the toe end, a counter adjacent the heel end, a sheath extending altitudinally between the toe and the counter and an apertured instep portion located between the toe and the sheath, the enclosure arrangement comprising:

an enclosure member having a wall, the wall including first edge areas for extending generally longitudinally along the welt area between the toe end of the sole and the shank, and second edge areas for extending generally altitudinally along the upper between the welt area, adjacent the shank, and a location on the sheath spaced altitudinally from the apertured instep portion a distance sufficient to establish a chamber overlying the apertured instep portion between the toe of the upper and the sheath;

means for joining the first and second edge areas with the boot so as to secure the enclosure member to the boot and establish a seal along said edges for sealing the chamber;

an access opening in the wall of the enclosure member and juxtaposed with the chamber to enable selective access to the chamber for placement therein of the warming device; and

closure means for selectively opening and closing the access opening.

4,373,275

FOOTWEAR

Graeme K. Lydiard, Auckland, New Zealand, assignor to Lydiard Shoe Co. Ltd., Auckland, New Zealand

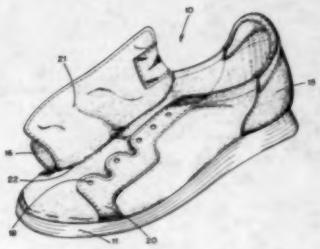
Filed Oct. 3, 1980, Ser. No. 193,464

Claims priority, application New Zealand, Oct. 19, 1979, 191885

Int. Cl.³ A43B 5/00, 23/26

U.S. Cl. 36—129 **1 Claim**

1. An athletic shoe, comprising a molded sole with an upper attached thereto characterized in that the forward section of the upper terminates short of the toe of the sole so as to form an opened toed shoe, the upper being affixed to the remainder of the sole to extend upwardly from the periphery thereof to form a heel portion joined to lateral portions, each lateral portion incorporating lace receiving apertures adjacently



along an upper edge thereof save for a section thereof bordering the heel portion to thus define in conjunction with the heel portion an ankle opening, a tongue attached along a lateral edge section thereof to one of the lateral sections of the upper, adjacent the attachment of the upper to the sole, the tongue being arranged to be disposed on lacing of the shoe beneath both sections of the upper incorporating the lace apertures.

4,373,276

DEVICE FOR CONVEYING A SLURRY, SUCH AS SAND OR GRAVEL OR THE LIKE, LYING UNDER WATER

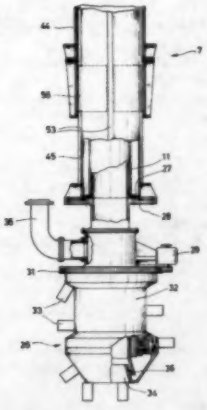
Ludwig L. Schnell, Aufhausen, Fed. Rep. of Germany, assignor to Schuttgutfordertechnik AG, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 235,318

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005669

Int. Cl.³ E02F 3/88

U.S. Cl. 37—61 **14 Claims**



1. Dredging apparatus for conveying bulk material such as sand, gravel or the like lying under water, said apparatus comprising the combination of

a dredger body,

a telescopic tube having a plurality of sections telescoping into one another, the upper end of said telescopic tube being fixed to said dredger body,

a conveyor head attached to the lower end of said telescopic

tube for collecting bulk material and directing it into said telescopic tube,

a flexible hose of fixed length extending through the interior of said telescopic tube and permitting telescoping movement of said tube sections thereover, and

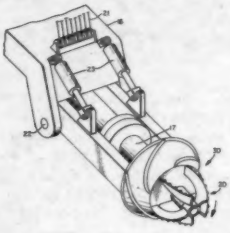
a hose reel mounted on said dredger body and connected to the upper end of said hose for winding and unwinding said hose during telescoping movement of the sections of said telescopic tube.

4,373,277

CUTTER EXTENSION CONE

Edward Cucheran, 23 Dunbar Crescent, Winnipeg, Canada

Filed Dec. 7, 1981, Ser. No. 328,136
Int. Cl.³ E02F 3/92
U.S. Cl. 37—67 2 Claims



1. A cutter extension cone for attachment to a cutter of a hydraulic dredge, said cutter having blades forcing material toward a suction orifice, comprising:

(a) a generally circular front section adapted to attach to the rear section of a cutter;

(b) a generally conical section extending rearwardly from said front section, said section having a conical surface, said one increasing in diameter toward the rear.

(c) a series of generally spiral helical blades along the surface of the cone extending from the front to the rear of the said cutter extension cone;

(d) said spiral helical blades on said cutter extension cone having a from front to rear in spiral direction the direction of rotation;

(e) said cutter extension cone attached to and rotating with said cutter as a unit

whereby said cutter extension cone smooths the bottom and forces material forward the suction orifice.

4,373,278

SINGLE LINE DEEP-SEA BUCKET AND RELEASE

Edward E. Myrick, Rte. 2, Box 223, Killen, Ala. 35645

Filed May 15, 1981, Ser. No. 263,917
Int. Cl.³ B66C 3/02; E02F 3/44
U.S. Cl. 37—71 12 Claims

1. A single line deep-sea bucket and release comprising in combination:

a hoisting frame connected by a single hoisting cable to the operating water surface area;

a bucket support frame measurably displaceable downwardly from said hoisting frame a selected operable distance;

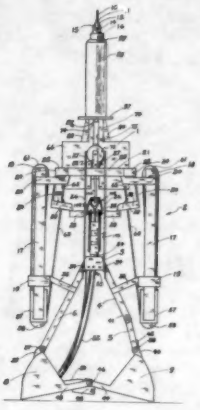
nesting means on said bucket support frame and hoisting frame to selectively receive and seat said hoisting frame and bucket support frame in nesting engagement;

said bucket support frame having a bail with an upward grippable projection thereon and dependent linkage supporting a clamshell with cable operating means thereon activating the opening and closing of said shell responsive to the measured withdrawal of said hoisting frame from the bucket support frame;

tether lines depending from said hoisting frame and connecting said hoisting frame and bucket support frame and guide means on the support frame limiting and guiding the relative displacement of the hoisting frame therefrom;

coupling means disposed between said grippable bail projection and the hoisting frame displaceably securing the end of said cable operating means of said clamshell to hoist and operate the same;

locking means on said hoisting frame releasably securing said coupling means, with auxiliary guide means therebe-



tween guiding and preventing torsion descent of said coupling means, and allowing a selective release and descent of said cable operating means and an emergency opening of said clamshell;

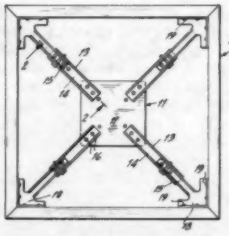
and emergency release means on said hoisting frame integral therewith and coacting with a messenger received along said single hoisting cable to release said locking means for said coupling and activate an emergency opening of the clamshell in the depths of said body of water.

4,373,279

FRAME STRAIGHTENING AND SUPPORTING DEVICE

Jack Abel, 16-24 202 St., Bayside, N.Y. 11360, and Cora Abel, 12 Lee St., Cambridge, Mass. 02139

Filed Sep. 5, 1980, Ser. No. 184,521
Int. Cl.³ G09F 1/12
U.S. Cl. 40—155 1 Claim



1. A frame supporting and tightening device comprising a rigid central plate disposed parallel to the plane of the frame, a plurality of adjustable segmented arms of channel shaped cross-section secured at one end to the central plate and extending outwardly thereof, said segmented arms comprising an inner segment secured to the central plate and an outer segment slidably carried by the inner segments, means to adjust-

ably secure the segments together, at least one bracket secured at the free end of each of the segmented arms and means to vary the position of the arm segments with respect to each other and the central plate to apply a desired force to portions of the frame.

4,373,280

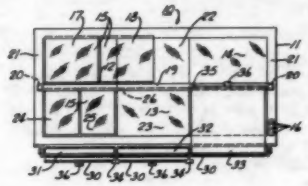
X-RAY VIEWING APPARATUS

Samuel L. Armfield, III, 522 Foltz Dr., Verona, Pa. 15147

Filed Oct. 14, 1980, Ser. No. 196,350

Int. Cl.³ G02B *27/02;* **A47F** *7/14;* **B60R** *1/02;* **A47G** *1/16*

U.S. Cl. 40—367 **5 Claims**



1. An adaptor for an X-ray viewer having an illuminated viewing panel, comprising, at least one horizontal cross bar secured across said viewing panel and movable to different vertical positions thereacross, means on a bottom edge of said cross bar to detachably retain a film edge, shade means on said X-ray viewer movable to shade lower areas of said illuminated panel while selectively permitting upper areas thereof directly above said lower shaded areas to remain unshaded, said shade means including at least two shades positioned side-by-side, including means to detachably secure said shade to said cross bar when said shades are drawn.

4,373,281

DEVICE FOR DISPLAYING INDICIA

James A. Sebastian, 24 Pinecrest Dr., Hastings-on-Hudson, N.Y. 10706

Division of Ser. No. 870,636, Jan. 19, 1978, Pat. No. 4,221,064, which is a continuation of Ser. No. 675,966, Apr. 12, 1976, abandoned. This application Jul. 9, 1980, Ser. No. 167,333

Int. Cl.³ G09F *11/00, 11/04;* **A63F** *1/18;* **A63B** *71/00*

U.S. Cl. 40—491 **17 Claims**

1. A device for displaying indicia comprising:

(a) at least one cover member of circular peripheral shape having at least one visual display means on at least one surface thereof:

(b) guide means forming a slot having a continuous circular periphery, said guide means being mounted on the cover member and said slot extending about the periphery of a predetermined area of the cover member, and

(c) at least one display member having a continuous circular periphery disposed in the slot formed by the guide means and rotatably and slidably movable with respect to said cover member about the predetermined area of the cover member, said display member having a smaller area than that of said predetermined area and being adapted to roll relative to the cover member in point to point continuous contact with the continuous circular periphery of the slot extending about the predetermined area in a plane parallel to the plane of the cover member, the display member containing on its surface at least two indicia prepositioned on said display member so that each is capable of registering with said visual display means in a different predetermined angular position of said device about a substantially horizontal axis in a substantially vertical plane, said display member shifting position and rotating with respect to said cover member in point to point continuous contact with the continuous circular periphery of the slot under the force of gravity in response to rotation about the substantially horizontal axis of said device from a first angular position into a second angular position of said device in the substantially vertical plane in order to change the registry of said indicia with respect to said visual display means.

4,373,282

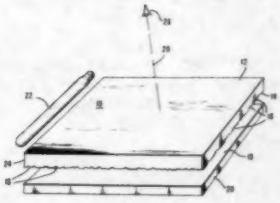
THIN-PANEL ILLUMINATOR FOR FRONT-LIT DISPLAYS

Robert Wragg, Glendora, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 106,952, Dec. 26, 1979, abandoned. This application May 29, 1981, Ser. No. 268,512

Int. Cl.³ G09F *13/18, 13/00;* **F21V** *7/04*

U.S. Cl. 40—546 **8 Claims**



1. A front-lit illumination panel for providing directional illumination to a display surface comprising:

(a) an optically transparent substrate having first and second parallel opposing major surfaces, said first major surface having a multiplicity of irregular depressions therein; and

(b) an optically transparent material having an index of refraction closely matching that of said substrate partially filling the depressions in said substrate so as to give each of said depressions a regular concave, meniscus shaped surface, each said depression thereby having gently sloping sides and a relatively shallow slope angle to said first major surface so that light from the interior of said substrate is selectively aimed through either said first or second major surface, the light exiting through said first major surface being directed toward a display surface co-extensive with and adjacent to said first major surface and the light exiting said second major surface being directed away from a viewer observing said display through said substrate.

4,373,283

ADVERTISING SIMULATED NEON SIGN DISPLAY

William M. Swartz, Highland Park, Ill., assignor to Embosograph Display Mfg. Co., Chicago, Ill.

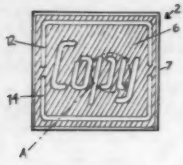
Filed Jul. 6, 1981, Ser. No. 280,700

Int. Cl.³ G09F *13/04*

U.S. Cl. 40—564 **8 Claims**

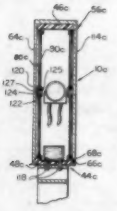
1. A simulated neon tube sign comprising a panel having a message portion which is clear and colorless and is transparent to visible light surrounded by a portion that is opaque to visible light, a printing on the message portion of a shape simulating a

neon tube and of a color of such tube when it is electrically actuated, said transparent area being a flat surface, said panel having a front side from which it is to be viewed and a reverse side on which the message is formed, said printing comprising a substantially transparent pigment and said opaque portion including an opaque reflecting medium on the back of the panel that reflects light impinging thereon from the rear of the panel in a direction rearwardly of the panel, a reflector located rearwardly of the panel, a light source comprising a fluores-



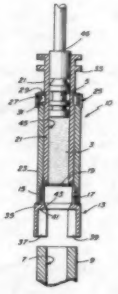
cent tube of a diameter substantially greater than the diameter of the simulated neon tube, said light source being between the reflector and the panel for illuminating the rear side of the panel, said reflector receiving light from the rear of the light source and also light reflected rearwardly of the panel by the afforesaid opaque reflecting medium on the reverse side of the panel and said reflector reflecting the incident light back towards said panel to increase the light passing through the transparent dye forming the simulated neon tube.

4,373,284
ILLUMINATED HOUSE NUMBER SIGN
Donald L. Crane, 309 Chicago Rd., Oswego, Ill. 60543
Filed Feb. 20, 1981, Ser. No. 236,336
Int. Cl.³ G09F *13/04*
U.S. Cl. 40—576 **7 Claims**



1. An illuminated house address sign comprising:
a rectangular frame member having
an elongated top wall,
an elongated bottom wall,
two end walls connecting the ends of said top and bottom walls, and
at least one open face,
a transparent rectangular cover member sized to slip over said frame member and to be frictionally retained in assembly therewith by means of a circumferentially sealing rib mating with a circumferential channel such that said open face on said frame member is enclosed and made weather tight,
at least one track member extending around the interior of said frame and cover assembly adjacent said open face,
said track member having a groove therein oriented perpendicular to the said walls of said frame and open to the interior of said frame,
at least one selectively removable track member extending across said open face of said frame member in the same plane as said fixed track member and parallel with said bottom wall,
said track member forming pairs of opposed grooves,
a plurality of plate members sized to be received in said opposed groove pairs,
said plate members having light transmitting portions therein in the shape of individual letters and numbers,
a light source interior of said track members,
a translucent sheet member sized to be received in said opposed groove pairs interior of said plate members
to diffuse the light from said light source, whereby a single or multi-level message can be displayed on at least one face of said sign by inserting or removing track members and placing appropriate plate members in abutting sequence in said opposed groove pairs to spell out the desired message.

4,373,285
GUN MUZZLE LOADER
Kenneth M. Grout, P.O. Box 190, Littleton, N.H. 03561, and David W. Presby, Hadley Rd., Sugar Hill, N.H. 03585
Filed Sep. 29, 1980, Ser. No. 191,397
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **4 Claims**



1. A loading device for a muzzle loading gun comprising:
(a) an attachment assembly provided with an elongated bore extending from the lower to the upper end of said assembly, the lower end of said assembly being adapted to be placed on the end of a gun barrel with said bore substantially in alignment with the bore of said gun barrel;
(b) a frangible septum held across the bore of said assembly substantially below its upper end, said bore above said septum being adapted to receive a powder charge and a projectile;
(c) said assembly including an elongated sleeve slidably mounted in said assembly above said septum, the bore of said sleeve comprising that portion of said assembly adapted to receive said charge and projectile;
(d) the lower edge of said sleeve being adapted to sunder said septum when forced through the location of said septum whereby said lower edge comprises means for sundering said septum.

4,373,286
REACTION GILL NET
Thomas E. Robison, Sea Cliff South, No. 1098, Daphne, Ala. 36526
Filed Oct. 16, 1980, Ser. No. 197,746
Int. Cl.³ A01K *74/00*
U.S. Cl. 43—10 **5 Claims**

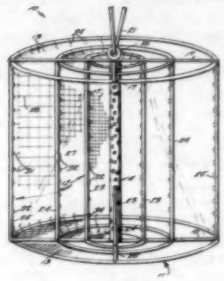
1. A gill net assembly comprising a frame comprising a top component, a bottom component, and at least one axially extending support interconnecting said top and bottom components; said top and bottom components each comprising a plurality of interconnected concentric rings, and said at least one axially extending support comprising a plurality of sets of

a plurality of bars, each set of a plurality of bars disposed to define the exterior surface of a cylinder or cone, the respected sets being substantially concentric;

a bait-enclosing structure;

a first net having openings formed therein large enough to allow small fish to insert their heads through the openings in an attempt to feed on bait in the bait-enclosing structure and catch their gills on the net if withdrawal from the opening is attempted;

means for mounting said first net to said frame adjacent a central portion thereof enclosing the sides of said frame and surrounding said bait-enclosing structure, said means comprising means formed on said frame components for attaching said first net to said components;



a second net, said second net having openings large enough to allow small fish which would be caught by said first net to pass completely therethrough, but small enough to allow larger fish to insert their heads through said second net openings and catch their gills on the second net if withdrawal from the openings is attempted; means for mounting said second net to said frame and substantially concentrically with said first net, and radially outwardly therefrom, and enclosing the sides of said frame, said means including means formed on said frame components for attaching said second net to said components; and

netting covering said top and bottom frame components.

4,373,287

FISHING TIP-UP

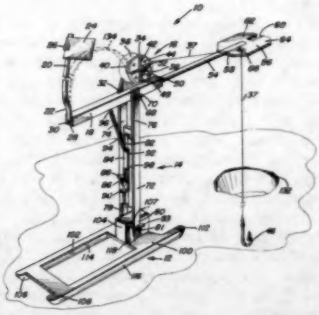
Paul F. Grahl, Rte. 1, Eden, Wis. 53019

Filed Oct. 3, 1980, Ser. No. 193,585

The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.

Int. Cl.³ A01K *97/01*

U.S. Cl. 43—17 **1 Claim**



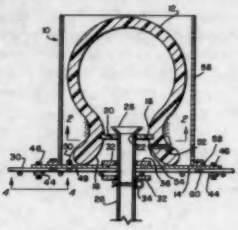
1. A fishing tip-up for supporting a fish hook at a predetermined depth in the water, jigging the hook vertically and signaling that a fish has moved the hook without manipulation by a fisherman, said tip-up comprising an elongated base member adapted to be positioned on a supporting surface with one end adjacent an edge of the body of water in which a fish hook is to be placed, an elongated body member extending upwardly from said base member, means pivotally connecting the lower end of the body member to the base member adjacent the end thereof disposed adjacent the edge of the body of water with the length of the body member above the base member being generally equal to the distance between the pivotal connecting means and the other end of the base member to enable the body member to overlie and co-extend with the base member when pivoted to a collapsed position, said pivotal connecting means including means to releasably lock the body member in adjustable angular relation to the base member, an elongated rocker arm disposed generally horizontally at the upper end of the body member, means pivotally connecting the rocker arm to the upper end of the body member for pivotal movement of the rocker arm about a generally horizontal axis with the pivotal connection being intermediate the ends of the rocker arm but offset from the center thereof to provide an elongated portion extending substantially beyond the end of the base member disposed adjacent the edge of the water, a wind vane rigidly mounted on the outer end of the elongated portion of the rocker arm and adapted to be disposed in overlying relation to a portion of the body of water, a spool frictionally and rotatably journaled on the rocker arm generally in alignment with and above the pivotal connection between the rocker arm and body member, a fishing line wound on said spool, a fish hook on the end of the fishing line, said wind vane including an aperture adjacent the inner edge thereof receiving the fishing line for movement therethrough when the spool is rotated and providing an anchor for the fish hook when the fishing line is wound onto the spool with the barb of the hook underlying the vane to reduce the possibility of the fish hook injuring a person handling the device and reduce entanglement with other fishing equipment, a flexible resilient member attached to the end of the rocker arm remote from the wind vane and extending upwardly therefrom, a signal flag on the upper end of the resilient member, said resilient member having a length permitting it to be bowed with the upper end engaged with the surface of the spool when in a "set" condition and being released therefrom by rotation of the spool when the fishing line is unwound therefrom by a fish taking the hook thereby enabling the resilient member to return to an upstanding position with the flag being readily observable to indicate that a portion of the fishing line has been pulled from the spool, a tension coil spring extending diagonally from the rocker arm to the body member on the side of the pivotal connection between the rocker arm and body member remote from the wind vane, means adjustably connecting one end of the spring to said body member to balance the rocker arm and enable oscillation thereof about the pivotal connection between the rocker arm and body member, said wind vane being in the form of a plate having bendable flaps thereon to vary the force exerted thereon by wind impinging thereon with movement of the wind vane being responsive to wind variations to jig the hook up and down as the rocker arm oscillates, said means connecting one end of the spring to the body member including an elongated slotted member received in a longitudinal recess in the body member, a fastener extending through the slotted member and body member to retain the slotted member guided by the recess and longitudinally adjusted, said slotted member including a laterally extending tab handle at the lower end to facilitate longitudinal movement of the slotted member when the fastener is loosened, said base member including longitudinal rails having extending ends to facilitate winding of fishing line thereon for storage, said rails being of substantially V-shaped configuration to enable the base member to be easily lifted from an ice surface even though the lower edges of the rails may be frozen into the ice.

4,373,288

SIGNALLING MEANS FOR A CRUSTACEAN TRAP

Michael P. McCrink, 43 Chapin Ave., Red Bank, N.J. 07701

Filed Dec. 1, 1980, Ser. No. 211,629
Int. Cl.³ A01K 69/00, 69/08
U.S. Cl. 43—100 8 Claims



1. Signalling means, for replaceable attachment thereof to a crustacean trap, which trap has an open-work wire, or equivalent-structured, substantially flat, top grid, said signalling means comprising:

means defining a substantially flat base for emplacement thereof, selectively, in any one of a plurality of positions, upon such an open-wire, or equivalent-structured, substantially flat, top grid of a crustacean trap;

means for removably retaining said base upon such top grid:

a buoyant element; and

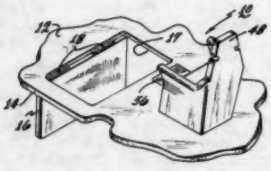
means coupled to said base releasably engageable with said buoyant element (a) for holding said element on such top grid, and (b) for suspending bait within such trap below such top grid.

4,373,289

TOY TRAP DOOR MECHANISM

Raymond J. Douglas, San Pedro; Herbert May, Torrance; Jeffrey B. Poznick, La Crescenta, and Roger H. Sweet, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 21, 1981, Ser. No. 332,642
Int. Cl.³ A63H 33/00
U.S. Cl. 46—1 R 6 Claims



1. A toy trap door mechanism, comprising:

a trap door;

a generally flat panel designed to support the trap door;

means for pivotably mounting the trap door within the panel so that the trap door may swing from a latched position parallel with the panel to an unlatched position below the panel;

an object designed to be rotatably mounted to the upper surface of the panel;

means for rotatably mounting the object to the panel including a pin depending from the object and extending through an opening in the panel so that the object can be rotated about the pin in a plane parallel to the plane of the panel; and

means mounted underneath the panel for operatively connecting the object to the trap door to both latch and unlatch the trap door, whereby when the object is rotated to a first object position the trap door is latched in the closed position, and when the object is rotated to a second object position, the trap door is unlatched, and where the means for operatively connecting the object to the trap door includes

an actuating lever;

means for supporting the lever underneath the panel between the object and the trap door including pivotably attaching the lever to the pin so that the lever may pivot freely about the pin in a manner which permits the object to rotate without causing the lever to pivot;

means for pivoting the lever to a first lever position where a first portion of the lever overlaps a portion of the trap door to latch the door closed; and

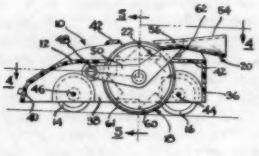
means for pivoting the lever to a second lever position were the first portion of the lever does not overlap the portion of the trap door, so that the door may swing to the unlatched position.

4,373,290

WHEELED TURBINE-POWERED TOY VEHICLE AND LAUNCHER APPARATUS

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.

Filed Jun. 22, 1981, Ser. No. 275,982
Int. Cl.³ A63H 29/16, 29/20
U.S. Cl. 46—44 11 Claims



1. A wheeled turbine-powered toy vehicle comprising:

(a) a frame;

(b) rotatable ground-engaging wheel means on the frame proportioned and arranged to maintain the toy vehicle upright, and including at least one drive-wheel;

(c) drive means on the frame and operatively coupled to said drive wheel for imparting rotation to said drive wheel, said drive means including a rotatably energy-storing fly wheel member and an air turbine operatively coupled to said fly wheel member to impart rotation to the fly wheel member; and

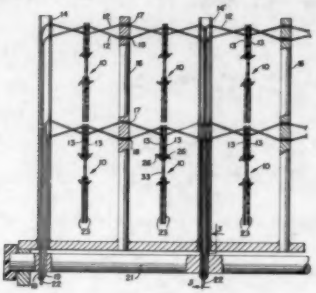
(d) user blow means mounted on said frame for directing a flow of user blown air against said air turbine so as to cause it to rotate, said blow means comprising a mouthpiece open to the atmosphere for the user to place into his or her mouth and blow air into, conduit means with an outlet, said conduit means being connected to and in communication with the mouthpiece for directing air blown into the mouthpiece out of said outlet, said outlet being positioned adjacent to said air turbine so as to direct air at said air turbine so as to cause it to rotate, said drive wheel being mounted on the frame for generally vertical movement toward and away from a supporting surface, said drive wheel, and fly wheel, and said turbine being combined in a single unit rotatably mounted on a carrier which is in turn rotatably supported on said frame, said drive wheel being free floating whereby it is free to rest by virtue of its weight, upon the surface supporting the toy vehicle.

4,373,291

PLURAL ACROBATIC FIGURES ON A STRING

Sun Chun-Jung, 10911 Orleans Way, Kensington, Md. 20795

Filed Nov. 24, 1980, Ser. No. 209,659
Int. Cl.³ A63H 3/18
U.S. Cl. 46—133 14 Claims



1. A toy comprising
a plurality of figures each having limbs and body portion with holes through a pair of said limbs,
a base having a supporting surface to support said plurality of figures having openings therethrough,
at least two hollow posts supported over said openings in said supporting surface with their hollow portions communicating with respective ones of said openings,
means rotatably mounted in said base beneath said supporting surface,
and a string having a double strand with said double strand connected to said rotatable means and passing from one point of relatively non-rotatable connection to said rotatable means through one of said hollow posts, through said holes in a pair of said limbs of each of said figures, and through another of said hollow posts to a second point of relatively non-rotatable connection with said rotatable means, each strand of said double strand passing through its individual series of holes, each series including a hole in each said post and a hole in each limb of one of said pairs.

4,373,292

DUAL CHARACTER DOLL

Carme D. Pelura, Pennsville, N.J., assignor to Neat Nap, Inc., Pennsville, N.J.

Filed Apr. 24, 1981, Ser. No. 257,361
Int. Cl.³ A63H 3/12
U.S. Cl. 46—153 9 Claims

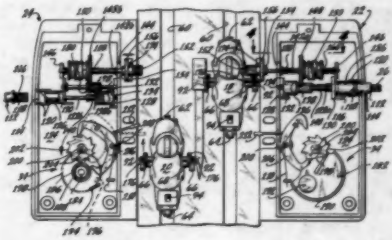
1. A dual character doll having front and back characters and having fastening means on both front and back characters for joining to a second, similar dual character doll at or near the hands thereof, wherein said fastening means comprise pads affixed near the hands thereof, said pads being of hook and loop type, at each fastening means location there being at least two pads, one such being of the hook type and one being of the loop type.

4,373,293

TOY RACING GAME

Katsumi Kakizaki, and Michihiro Kozuka, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,866
Claims priority, application Japan, Oct. 23, 1979, 54-147243[U]
Int. Cl.³ A63H 18/00
U.S. Cl. 46—206 14 Claims

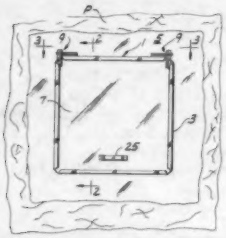


1. An improvement in a toy racing game incorporating a wind up spring motor powered vehicle which rides on a track which comprises:
said vehicle including a winding member operatively connected to said spring motor and capable of winding said spring motor if acted on by an external source;
a vehicular energizing station located in association with said track and capable of interacting with said vehicle winding member to wind the spring motor in said vehicle;
said vehicular energizing station including vehicle engagement means movably mounted in said station between a first position wherein said vehicle is free to pass by said station in said track without interacting with said station and a second position wherein said vehicle is engaged by said vehicle engagement means and is retained at said station;
said vehicle engagement means including a rotary motion transfer member, said rotary motion transfer member being capable of operatively engaging said winding member for winding said spring motor when said vehicle engagement means is in said second position;
rotary motion means capable of being operated by an operator of said game and producing a rotary output in response to said operation;
connecting means operatively connecting said rotary motion means to said rotary motion transfer member transferring said rotary output of said rotary motion means to said rotary motion transfer member to move said vehicle engagement means between said first and said second positions when said rotary motion transfer member is rotated and to supply rotary motion to said winding member when said vehicle is at said energizing station and said vehicle engagement means is in said second position.

4,373,294
DOOR FOR A MINE STOPPING HAVING KNIFE-EDGE HINGES

John M. Kennedy, and William R. Kennedy, both of P.O. Box 38, Taylorville, Ill. 62568

Filed Oct. 17, 1980, Ser. No. 198,203
Int. Cl.³ E05D 7/88
U.S. Cl. 49—388 3 Claims



1. A door for closing a man-door opening in a mine stopping, said door being of metal and having a pair of knife-edge hinges, one at each of the two upper corners of the door for mounting the door to swing about a horizontal axis adjacent the top edge of the man-door opening between open and closed positions, each knife-edge hinge comprising a horizontally extending pivot pin and a vertically extending lug comprising a relatively thin metal plate member having a hole therein adapted to receive the pivot pin, whereby the area of engagement between the pivot pin and the lug is relatively small so that corrosion on the hinge at said area of engagement does not prevent opening of the door;

means for mounting said pivot pins at the top of the man-door opening;

said mounting means comprising a pair of brackets, each bracket having a generally vertical web, a generally horizontal lower flange extending away from the door, and a generally horizontal upper flange extending over the door, each pivot pin being welded to the upper flange of the respective bracket;

and a door frame being mounted in the man-door opening;

said door frame having a top, bottom, and two side channel members each having first and second flanges and a web therebetween, the web of each channel member being adjacent an edge surface of the stopping at the opening therein, the first flange of each channel member extending alongside the face of the stopping toward the door, and the second flange of each channel member extending alongside the face of the stopping away from the door.

4,373,295
RESILIENT FRICTION SASH BALANCE

William R. Starck, Greenwich, Conn., assignor to A.M.S. Corporation, South Norwalk, Conn.

Filed Nov. 12, 1980, Ser. No. 211,327
Int. Cl.³ E05D 15/16
U.S. Cl. 49—435 2 Claims

1. A unitary sash guide for slidingly embracing the juxtaposed side edges of a pair of double-hung inner and outer window sash units, and guiding their sliding opening and closing movement in a window opening, comprising

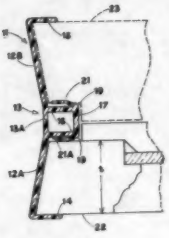
an arched portion spanning the side edge of the window opening and having a central channel-shaped parting bead protruding convexly into the window opening,

an inner terminal flange protruding from the inner part of the arched portion into the window opening,

an outer terminal flange protruding from the outer part of the arched portion into the window opening,

a slanting inner wing flange extending cantilever-fashion diagonally from an inner corner of the channel-shaped parting bead toward the arched portion and the inner terminal flange, forming therewith a channel-shaped groove embracing the side edge of the inner sash unit,

and a slanting outer wing flange extending cantilever-fashion diagonally from an outer corner of the channel-shaped parting bead toward the arched portion and the outer terminal flange, forming therewith a channel-shaped groove embracing the side edge of the outer sash unit,



with each wing flange incorporating a substantially flat distal edge panel,

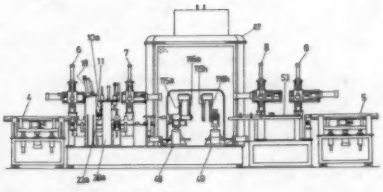
and with the entire sash guide being a unitary extrusion formed of plastic material,

whereby each of the two sash units is slidingly gripped in resilient tractive balancing engagement between a terminal flange and a facing slanting wing flange resiliently deformed by the embraced sash unit.

4,373,296
DEBURRING APPARATUS FOR WORKPIECES

Hisamine Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Shikishima Tipton, Aichi, Japan

Division of Ser. No. 972,487, Dec. 22, 1978, Pat. No. 4,280,304.
This application Jan. 10, 1980, Ser. No. 110,843
Claims priority, application Japan, Jan. 25, 1978, 53-7723
Int. Cl.³ B24B 29/00, 31/00, 51/00
U.S. Cl. 51—3 11 Claims



2. An apparatus for deburring and finishing workpieces, said apparatus comprising:

intermittently driven carrying means for forwarding workpieces successively at regular intervals and operable alternately to move distances or pitches equal to said regular intervals during movement periods of time and to be stationary during stationary periods of time;

at least one deburring apparatus positioned adjacent said carrying means and including portions on opposite sides of said carrying means, said deburring apparatus including rotating and reciprocating tool means for, during stationary periods of time, removing burrs from successive selected said workpieces, thereby to form semi-finished workpieces;

workpiece holding means for, during stationary periods of time, holding said selected workpieces in position on said carrying means during removal of said burrs;

gyro-finishing means, located downstream of said deburring

apparatus with respect to the direction of movement of said carrying means, for subjecting successively said semi-finished workpieces to a finishing operation, thereby forming finished workpieces, said gyro-finishing means including a central vertical shaft, support plates fixed to said central vertical shaft, a rotatable finishing tub positioned below said central vertical shaft and containing an abrasive media, a plurality of finishing units supported by said support plates and spaced around said central vertical shaft, each said finishing unit including means for grasping a said semi-finished workpiece, means for lowering the thus grasped semi-finished workpiece into said abrasive media, and means for rotating said semi-finished workpiece in said abrasive media about a vertical axis of the respective said finishing unit, thereby to perform said finishing operation, and means for indexing said central vertical shaft, said support plates, said finishing units and the said grasped workpieces about the axis of said central vertical shaft;

semi-finished workpieces transferring means for, during stationary periods of time, transferring successively said semi-finished workpieces from said carrying means to said gyro-finishing means at an inlet position thereof; and

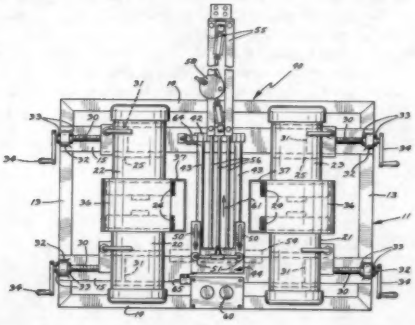
finished workpiece transferring means for, during stationary periods of time, discharging successively said finished workpieces from said gyro-finishing means at an outlet position thereof.

4,373,297

DEBURRING MACHINE

Donald W. Pennertz, and Ritchie J. Burkey, both of Alexandria, Minn., assignors to Alexandria Extrusion Company, Alexandria, Minn.

Filed Dec. 10, 1980, Ser. No. 215,122
Int. Cl.³ B24B *9/00*; A47L *15/00*
U.S. Cl. 51—84 R **4 Claims**



1. A deburring machine comprising:

a frame;

a pair of spaced parallel track members each having a longitudinal direction and being mounted on said frame;

a pair of motors on each track member mounted for selectable movement along the respective track member, each of said motors being spaced apart from the other motor on the respective track member, said motors each having an output shaft, and each motor output shaft having a separate abrading brush mounted thereon, the motors being oriented so that the output shaft of each motor on each track member is oriented facing toward a corresponding motor on the other track member and generally aligned therewith so that the brush of each motor on each track member is adjacent the brush of the corresponding motor on the other track member and located between the track members, the rotational planes of the brushes being between the track members;

a workpiece carrier;

means to slidably mount the carrier supported on and extending between and generally perpendicular to the track members, the means to slidably mount being positioned between the pair of motors on the respective track member;

a power cylinder mounted on the means to slidably mount and connected to the workpiece carrier to permit moving the workpiece carrier from a first home position on one side of the planes of all the brushes to a second retracted position on an opposite side of the planes of said brushes; and

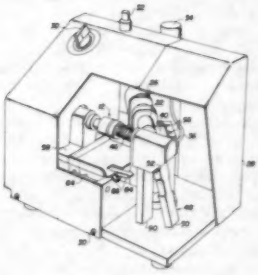
clamp means on said workpiece carrier to clamp and support an elongated workpiece with opposite end portions of the workpiece extending outwardly from the workpiece carrier, said motors being adjusted to position whereby the brush on each of the motors will engage portions of a workpiece carried on the workpiece carrier to deburr such workpiece as the workpiece carrier is moved between its home and retracted positions.

4,373,298

AUTOMATIC EDGE BEVELLER FOR REMOVING THE SHARP PERIPHERAL EDGES OF OPHTHALMIC LENSES

Joseph Tusinski, and Phillip D. Hill, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Jan. 30, 1981, Ser. No. 229,911
Int. Cl.³ B24B *5/14*
U.S. Cl. 51—105 LG **6 Claims**



1. An edge beveller for removing the sharp peripheral edges of opthalmic lenses, said edge beveller comprising:

(a) a pair of clamps sized and shaped to grip the opthalmic lens therebetween such that the opthalmic lens is perpendicular to a first axis which extends through the opthalmic lens and the edge of the opthalmic lens projects radially outwardly from between said clamps;

(b) a first spring which biases a first one of said pair of clamps to resiliently grip the opthalmic lens therebetween;

(c) first means for rotating the opthalmic lens about the first axis;

(d) a grinding wheel mounted for rotation about a second axis set at an acute angle to the first axis;

(e) second means for rotating said grinding wheel about the second axis;

(f) a carriage on which said second one of said pair of clamps is mounted, said carriage being linearly movable in a direction parallel to said first axis;

(g) a second spring which biases said carriage towards said grinding wheel;

(h) third manually operable means actuation of which moves said first one of said pair of clamps against the bias supplied by said first spring;

(i) fourth manually operable means activation of which moves said second one of said pair of clamps against the bias supplied by said second spring; and

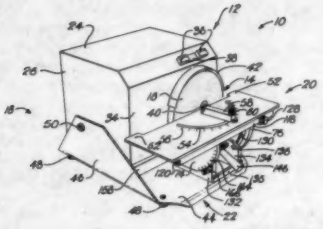
(j) fifth manually operable means for locking said second one of said pair of clamps away from said grinding wheel against the bias of said second spring.

4,373,299

TOOL FINISHING MACHINE HAVING IMPROVED SUPPORT TABLE

Harold W. Gaston, and Donald J. Glaser, both of Emporia, Kans., assignors to Glendo Corporation, Emporia, Kans.

Filed Feb. 13, 1981, Ser. No. 234,424
Int. Cl.³ B24B 7/02
U.S. Cl. 51—122 **8 Claims**



1. In a tool sharpening and finishing machine having a rotatable wheel provided with an abrasive, tool-engaging face and a tool-supporting table adjacent said face, structure supporting said table including:

an elongated element underlying said table;

means interconnecting the table and said element;

an elongated base underlying the element;

rollers on the base engaging the longitudinal edges of said element and supporting the latter for reciprocation along the base,

said base having a longitudinal slot extending inwardly from one end thereof in the direction of reciprocation of said element, presenting a pair of elongated sections,

there being a roller on each section respectively

stationary means underlying the base; and

means attaching the base to said stationary means and holding one of the sections against movement toward and away from the other section,

the roller on said other section having means yieldably biasing the latter toward said one section.

4,373,300

APPARATUS FOR COLLECTING PARTICLES PRODUCED DURING ABRADING OF PRECIOUS METALS

Lyle D. Partridge, 507 Mustang Rd., Heber Springs, Ark. 72543

Filed Sep. 2, 1980, Ser. No. 183,254
Int. Cl.³ B24B 55/00
U.S. Cl. 51—270 **2 Claims**

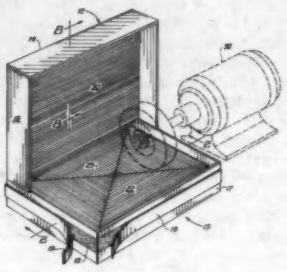
1. In combination with apparatus for abrading a substance, a degradable collector for

capturing particles separated from said substance during said abrading thereof, and minimizing the number of particles which contact said collector and rebound therefrom onto the area surrounding said collector,

said collector comprising a thermally or chemically destructible container including a hollow base having adhesive means on the exterior sides thereof; a lid having one end pivotally connected to said base along one side thereof and depending flaps movable with said lid to a container closing position engaging said adhesive means; said base and lid each including a baffle member having a plurality of spaced elongate panel members, each of said elongate panel members having a pair of opposed planar surfaces co-terminating along an edge defining at least in part the periphery of said panel member, said elongate panel members being spaced such that

(a) at least one group of said elongate panel members are generally parallelably disposed with respect to one another,

(b) said edges thereof define a striated surface for receiving and capturing said particles produced during the abrading of said substance, and



(c) each of said particles captured by said baffle members downwardly falls into a space between an adjacent pair of said elongate panel members,

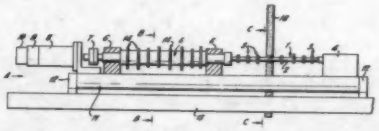
(d) said baffle member of said lid and said base, each being disposed in spaced relation to the adjacent surface of its respective lid or base so as to define communicating chambers when said lid is in the open position.

4,373,301

CAM MACHINING

John D. Parnum, Netherton, and Nigel T. Barber, Rugby, both of England, assignors to The Newall Engineering Company Limited, Peterborough, England

Division of Ser. No. 926,384, Jul. 20, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 79,700
Claims priority, application United Kingdom, Jul. 26, 1977, 31406/77
Int. Cl.³ B24B 1/00
U.S. Cl. 51—281 C **9 Claims**



1. A method of machining a cam profile on a workpiece comprising the steps of rotating the workpiece adjacent to a machine tool, producing movement of the workpiece relative to the machine tool in a lateral direction with respect to the axis of rotation of the workpiece so that the machine tool removes stock from the workpiece to form a predetermined cam profile thereon, continuously monitoring the angular displacement of the workpiece relative to a datum during formation of said cam profile, pre-programming a memory with a speed programme relating different rotational speeds of the workpiece for a substantially constant stock removal rate to a number of individual angular displacements of the workpiece from said datum, pre-programming a memory with acceleration data relating to the changes of speed required by said speed programme at the different angular positions of the workpiece and, once machining of the workpiece has commenced, continuously measuring the angular displacement of

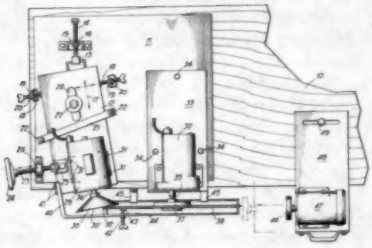
the workpiece from said datum and, at the selected angular displacements at which a change of rotational speed is dictated by said speed programme, adjusting the speed of rotation of the workpiece to the speed determined by the speed programme and at an acceleration determined by the acceleration programme and maintaining the workpiece at the new speed until the new angular displacement from said datum dictates the next change in rotational speed of the workpiece, and repeating this process until the predetermined cam profile is formed on the workpiece.

4,373,302

SHARPENING APPARATUS FOR CIRCULAR BLADES

Emory C. Darby, P.O. Box 853, Covington, Ga. 30209

Filed Nov. 17, 1980, Ser. No. 207,338
Int. Cl.³ B24B *3/36*
U.S. Cl. 51—131.1 **1 Claim**



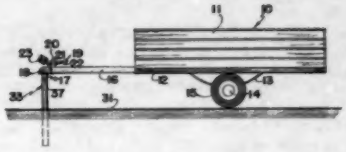
1. A self-contained sharpening apparatus for sharpening thin circular blades of large diameter and being bodily mountable on a work bench, the apparatus comprising a flat base plate mountable on a support surface of a work bench, a gear motor including a mounting plate secured to said base plate near one side thereof and having a driven shaft turning at a comparatively low speed of rotation and projecting beyond one edge of the base plate, means carried by the driven shaft to releasably secure a large diameter thin circular blade thereto for rotation with the shaft for sharpening, a comparatively high speed drive motor having a mounting base forming a slide, the drive motor having a driven shaft and a cone grinding wheel secured to such shaft for comparatively high speed rotation therewith and having a frontal grinding face, screw-threaded adjusting means on the base plate and engaging the slide to move the slide laterally, longitudinally and angularly with respect to the rotational axis of the grinding wheel, whereby the frontal grinding face of such wheel can be precisely adjusted to a required acute angle to the plane of rotation of the circular blade, the frontal grinding face extending across the peripheral edge of the circular blade on the side of the blade nearest to the gear and drive motors and exerting pressure on the blade edge sufficient to produce grinding and sharpening of the blade edge, means on said base plate and engaging the slide to lock the slide fixedly in a selected adjusted position, an arm fixed to the slide near one forward corner thereof and spaced from one side of the drive motor and grinding wheel, the arm extending forwardly of the grinding wheel and circular blade and having a lateral extension across and spaced from the frontal grinding face of the wheel and the forward face of the circular blade, an adjustable and lockable screw-threaded circular blade stabilizing shoe carried by the lateral extension of the arm substantially at right angles to the rotational plane of the blade, and said shoe slidably engaging the forward face of the blade near and radially inwardly of the peripheral edge of the blade in opposing relationship to the forward grinding face of the grinding wheel.

4,373,303

IN-GROUND TRAILER POST ASSEMBLY

Joseph Stratichuk, 4226 Batchelor Ave., Winnipeg, Manitoba, Canada

Filed Jun. 30, 1980, Ser. No. 164,885
Int. Cl.³ E04H *12/22, 12/00*; B60R *27/00*
U.S. Cl. 52—40 **5 Claims**



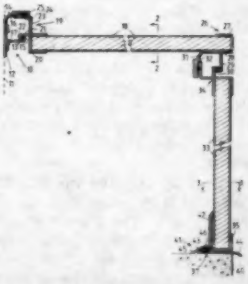
1. An in-ground trailer hitch post assembly for travel trailers, utility trailers and the like which include a hitch frame extending therefrom with a hitch ball receiving cup assembly on the front end thereof; comprising in combination a ground engaging portion and a post portion detachably engaging the upper end of said ground engaging portion, said ground engaging portion including a screw threaded tubular coupling portion on the upper end of said ground engaging portion situated substantially flush with the ground surface when installed therein, said post portion including a hitch means secured to the upper end thereof detachably engageable with the ball receiving cup of the associated trailer, and a screw threaded lower end screw threadably engaging within said screw threaded tubular coupling portion, said ground engaging portion comprising an elongated member situated vertically within the ground when installed, said screw threaded tubular coupling portion being screw threadably engageable upon the upper end of said elongated member and terminating substantially flush with the ground surface.

4,373,304

PREFABRICATED BUILDING UNITS

Ronald W. Howitt, 19 Holland Ct., Moana Park, Queensland, Australia (4217)

Filed Sep. 16, 1980, Ser. No. 187,798
Claims priority, application Australia, Mar. 18, 1980, PE2790
Int. Cl.³ E04B *7/16*; E04C *1/30*
U.S. Cl. 52—73 **4 Claims**



1. Prefabricated building units including:
a mounting rail,
means for supporting the mounting rail substantially horizontally at roof height,
a plurality of substantially rectangular roofing panels,
an engagement piece across the head of each roofing panel capable, when the roof panel is at an angle to horizontal

greater than the pitch of the roof to be installed, of being releasably engaged pivotally with the mounting rail, and

sealing means which, when the roofing panel is raised pivotally to the said pitch, automatically effects a seal between the mounting rail and the engagement piece;

wherein:

the mounting rail and the engagement piece are formed with hooked members releasably inter-engageable pivotally,

the mounting rail includes a flange with an underside curved in cross-section,

the attachment piece includes a flange with a normally upper surface so curved in cross-section that when the roof panel is raised pivotally to the said pitch it moves closely under the curved underside of the mounting rail flange, and

the sealing means includes a sealing strip which, when the roof panel is raised pivotally to the said pitch, is brought between the curved surfaces of the mounting rail flange and the attachment piece flange.

4,373,305

ARCH FORMING STRUCTURE

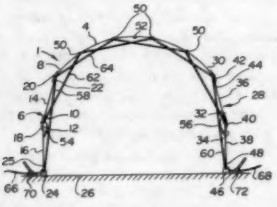
Leslie T. Russell, Halifax, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Feb. 6, 1981, Ser. No. 232,371

Claims priority, application Canada, Apr. 10, 1980, 352073

Int. Cl.[3] E04B *1/32*; E04C *3/46*

U.S. Cl. 52—86 **4 Claims**



1. An arch forming structure, comprising:

(a) a flexible member, substantially flat in the collapsed condition and for bending therefrom to form, in the erected condition, the arched portion of the structure,

(b) a first pair of hinged strut members at a first end of the flexible member with two adjacent ends of the strut members thereof hinged together and the strut members when folded together at the hinge, in the collapsed condition, extending beneath the flexible member from the first end thereof towards the hinge, the hinge allowing limited pivotal movement between the strut members for them to be unfolded and then restrained against further pivotal movement at the erected position through dead center,

(c) a first connecting hinge pivotally connecting a free end of the first pair of hinged strut members to the first end of the flexible member,

(d) a first base hinge for pivotally attaching the other free end of the first pair of hinged strut members to a base,

(e) a second pair of hinged strut members at a second end of the flexible member, with two adjacent ends of the strut members hinged together and the strut members when folded together at the hinge, in the collapsed conditions extending beneath the flexible member from the second end thereof towards the hinge, the hinge allowing limited pivotal movement between the strut members for them to be unfolded and then restrained against further pivotal movement at an erected position through dead center,

(f) a second connecting hinge pivotally connecting a free end of the second pair of hinged strut members to the second end of the flexible member,

(g) a second base hinge for pivotally attaching the other free end of the second pair of hinged strut members to a base,

(h) a plurality of tension line guides attached to the flexible member at spaced intervals to a side of the flexible member which will define the inside of the arch so that the tension line guides will be spaced therearound,

(i) a first tension line deflecting guide attached to the first pair of hinged strut members at a position adjacent the hinge thereof and beneath the strut members thereof when they are folded together in the collapsed condition,

(j) a second tension line deflecting guide attached to the second pair of hinged strut members at a position adjacent the hinge thereof and beneath the strut members thereof when they are folded together in the collapsed condition,

(k) a first tension line length secured by one end to a portion of the first pair of hinged strut members in the region of the first base hinge and extending along the struts of the first pair of hinged strut members and deflected therefrom by the first tension line deflecting member, with the other end of the first tension line length secured to a portion of the first pair of hinged strut members in the region of the first connecting hinge,

(l) a second tension line length secured by one end to a portion of the second pair of hinged strut members in the region of the second base hinge and extending along the strut members of the second pair of hinged strut members and deflected therefrom by the second tension line deflecting member, with the other end of the second tension line length secured to a portion of the second pair of hinged strut members in the region of the second connecting hinge,

(m) a third tension line length fastened by one end to the first pair of hinged strut members in the region of the hinge thereof and threaded through odd number tension line guides only, counted from the first pair of hinged strut members, and

I. when an even number of tension line guides are provided, secured at the other end to the second pair of strut members in the region of the second connecting hinge,

II. when an odd number of tension line guides are provided, secured at the other end to a portion of the second pair of strut members in the region of the hinge thereof,

and

(n) a fourth tension line length fastened by one end to the first pair of strut members in the region of the first connecting hinge and threaded through even number tension line guides only, counted from the first pair of hinged strut members, and

III. when an even number of tension line guides are provided, secured at the other end to the second pair of strut members in the region of the hinge thereof,

IV. when an odd number of tension line guides are provided, secured at the other end to the second pair of strut members in the region of the second connecting hinge,

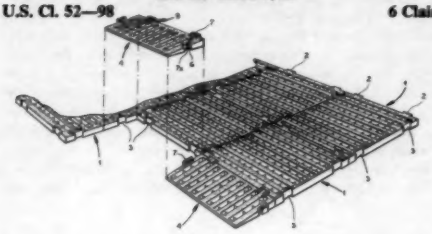
whereby,

(o) tensioning of the first and second tension line lengths with movement of the first and second pairs of hinged struts from the collapsed condition through dead center to the erected condition will cause the third and fourth tension line lengths to bend the flexible member and form the arched portion of the structure.

4,373,306
COUPLING FORMATION FOR THE INTERFITTING OF STRUCTURAL ELEMENTS

Jacques Rech, Le Chesnay, France, assignor to Allibert Exploitation, Grenoble, France

Filed Feb. 5, 1980, Ser. No. 127,310
Int. Cl.³ E01C 5/20
U.S. Cl. 52—98 6 Claims



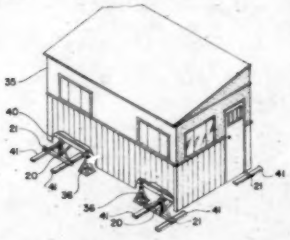
1. In an assembly of structural elements detachably interconnected by means of interfitting complementary coupling formations, said elements including related edges and spaced faces,

the improvement wherein hybrid-type coupling formations on said angularly related edges of at least one of said elements each comprise an undercut recess flanked by overhanging surface portions and a generally T-shaped projection rising from said recess, said projection having a stem frangibly secured to the bottom of said recess and a head spacedly overlying said overhanging surface portions with a profile substantially complementary to the inverted profile of said recess, the latter being exposed at said faces and laterally accessible from said faces for engagement with positive fit by a tenon of like inverted profile on another of said elements upon break-off of said stem at the bottom of said recess.

4,373,307
ADJUSTABLE EARTHQUAKE BACKSTOP SUPPORT FOR MOBILE HOMES

George Q. Evans, Paramount, Calif., assignor to Earthquake Preparedness Co., Inc., Paramount, Calif.

Filed Apr. 6, 1981, Ser. No. 251,503
Int. Cl.³ E04D 15/00
U.S. Cl. 52—167 6 Claims

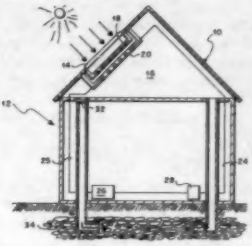


1. A backstop support for a mobile home having an underframe; said support comprising a cross-beam, adjustable means for supporting said cross-beam in a position underlying but spaced from said underframe, and means for preventing relative displacement of said cross-beam and underframe longitudinally of said cross-beam when said cross-beam is supported in said position.

4,373,308
HOUSING STRUCTURE UTILIZING SOLAR ENERGY

Ralph E. Whittaker, Danville, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 24, 1981, Ser. No. 257,298
Int. Cl.³ H01L 31/04; F24J 3/02
U.S. Cl. 52—173 R 7 Claims



1. In a solar energy-utilizing building including: a roof and exterior walls, the improvement comprising:

a. a translucent member covering an opening in said roof,

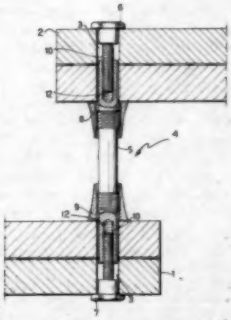
b. elongated solar cell means supported within said walls, beneath said roof in spaced relation to said translucent member so as to absorb solar energy passing therethrough, said solar cell means being rotatable about its longitudinal axis, and

c. a flat plate thermal solar collector fixedly supported in spaced relation to said solar cell means so as to absorb heat energy passing through said translucent member.

4,373,309
SUPPORTING BOLT

Gerhard Lutz, Reutlingen, Fed. Rep. of Germany, assignor to Gelu Reutlinger Steinwerk Gerhard Lutz GmbH, Reutlingen, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,407
Int. Cl.³ E04F 11/00; F16B 37/00
U.S. Cl. 52—182 9 Claims



1. A supporting bolt assembly for connecting prefabricated steps together into a stairway, said supporting bolt assembly readily permitting the steps in said stairway to be adjusted, partially disassembled and completely disassembled with respect to each other, said supporting bolt assembly comprising a one-piece, long-shanked middle bolt formed with an axial threaded bore in each of its end portions, each said step being formed with a plurality of through bores of a size and configuration to snuggly receive an end portion of said middle bolt, said supporting bolt assembly further comprising a pair of end pieces each comprising a head portion and a threaded shank,

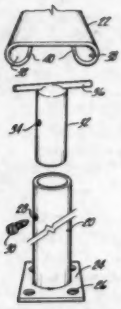
said end piece head portion having a size and configuration large enough to prevent it from passing through said step through bore, said end piece threaded shank mating with said axial threaded bore in said middle bolt end portion, said middle bolt being formed with a pair of externally threaded sections each located in predetermined spaced relation to a respective end portion of said middle bolt, said supporting bolt assembly further comprising a pair of retainers having threaded bores to mate with said middle bolt externally threaded sections respectively; whereby a stairway can be readily constructed, adjusted, and partially or totally disassembled using a plurality of said prefabricated steps and a plurality of said supporting bolt assemblies by mounting each step at it's through bore at an end portion of a middle bolt of a supporting bolt assembly between a head portion of an end piece and the adjacent retainer on said middle bolt of said supporting bolt assembly.

4,373,310

STAIRCASE HANDRAIL CONSTRUCTION

Robert Dean, 406 S. Shiawassee, Owosso, Mich. 48867

Filed Apr. 14, 1980, Ser. No. 140,315
Int. Cl.³ E04F *11/00*
U.S. Cl. 52—182 **6 Claims**



1. A handrail assembly for use with a staircase having treads, said assembly comprising:

a continuous rail having a top and a pair of return bent and downwardly depending flanges, said flanges forming a pair of facing channels between the side walls along the length of said rail, each flange having a free edge positioned underneath the top, said free edges being spaced apart from each other and forming a slot therebetween;

a tee member having a lower portion and an upper pin secured transversely across the upper end of the lower portion, said pin insertable into said pair of channels through said slot, said pin having a length substantially the same as the spacing between the side walls so that, with said pin positioned transversely across said rail and within said channels, the ends of the pin frictionally engage said side walls,

an elongated post having one end secured to and extending upwardly from at least one of said treads; and

means for fixedly securing the lower portion of said tee member to the other end of said post.

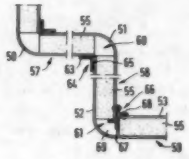
4,373,311

INTEGRAL HOUSING BODY

Wolfgang Artweger, Windischgarsten, Austria, assignor to Hutter & Schranz Bautechnik Gesellschaft m.b.H., Klagenfurt, Austria

Filed May 2, 1980, Ser. No. 145,888
Claims priority, application Austria, Jun. 28, 1980, 4502/79
Int. Cl.³ E04C *2/24*
U.S. Cl. 52—282 **5 Claims**

1. A housing body comprising a plurality of composite wall elements, each wall element consisting of an outer carrier plate, an inner carrier plate and a rigid synthetic resin foam support member sandwiched therebetween, the support members of adjoining one of the wall elements having end faces spaced from each other and forming a corner between the adjoining wall elements, the outer carrier plate being shaped to form the corner and spanning the space between the end faces of the support members of the adjoining wall elements whereby the outer carrier plate is common to the adjoining wall elements and the support member end faces define the space with the outer carrier plate, a load-bearing rigid synthetic resin foam core in the space and rigidly and directly bonded to the outer carrier plate and to the end faces of the support members of the adjoining wall elements in a force-transmitting manner, adjacent ones of the wall elements extending substantially perpendicularly to each other, alternating ones of the wall elements being substantially parallel to each other, all the wall elements and interconnecting foam cores



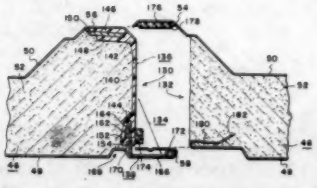
forming an integral structure, and alternating ones of the foam cores being connected to alternating ones of the carrier plates, and studs at the corners, the studs interconnecting abutting ones of the inner carrier plates and the studs being shaped elements having a first abutment part, a portion of the first abutment part being adjacent one of the abutting plates and being connected thereto and another portion thereof extending into the space at the corner and being adjacent the face of the support member of one of the adjoining wall elements, the other abutment part portion being connected to the support member face, and two additional abutment parts extending substantially perpendicularly from the first abutment part, one of the additional abutment parts being adjacent the other abutting plate and being connected thereto and the other additional abutment part extending into the space at the corner and being adjacent the face of the support member of the other adjoining wall element, the other additional abutment part being connected to the adjacent support member face.

4,373,312

PREFABRICATED PANEL CONSTRUCTION SYSTEM

Kwon S. Kim, Oklahoma City, Okla., assignor to Star Manufacturing Co., Oklahoma City, Okla.

Continuation of Ser. No. 893,435, Apr. 4, 1978. This application Sep. 9, 1980, Ser. No. 185,548
Int. Cl.³ E04C *1/10*
U.S. Cl. 52—309.9 **2 Claims**



1. A prefabricated panel for use with like panels in constructing a roof of a building, comprising:

a body of insulating material having opposite upper and lower major faces, first and second opposite sides and first and second opposite ends;

upper and lower corrugated metal sheets disposed on upper and lower major faces of the insulating body, the upper and lower sheets each having a flap extending beyond the insulating body at the first and second opposite ends of the insulating body, respectively, to form respective leading and trailing ends of the panel;

the lower metal sheet having first and second folded edges extending along respective first and second opposite sides of the panel, without extending beyond the end of the insulating body at said first and second ends thereof, whereby the second end of an adjacent panel of similar construction may be mounted on the leading end flap of the upper sheet without interference from the folded edges to facilitate end-to-end assembly of roof panels; and

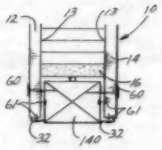
the first folded edge extending outwardly from the first side of the insulating body to form a leading edge of the panel and the second folded edge being embedded within the insulating body adjacent to the second side thereof to form a trailing edge of the panel for placing similar roof panels in side-by-side abutting relationship.

4,373,313

WATER-TIGHT RIGID STRUCTURAL PANEL

Edgar M. Nash, Jr., 32814 Maverick Dr., Porterville, Calif. 92357

Filed Jul. 22, 1980, Ser. No. 171,103
Int. Cl.³ E04C 2/32
U.S. Cl. 52—397 **11 Claims**



1. A load bearing wall comprising:

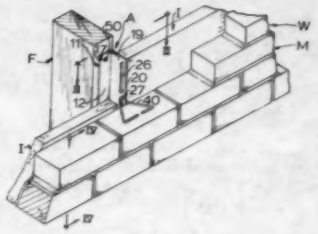
a framework including top and bottom horizontal members joined by spaced vertical members, and wall panels extending between the horizontal and vertical members, each wall panel including a pair of solid rectangular panel sheets spaced apart by a distance slightly greater than the thickness of the framework members, the sheets overlapping the framework members, core means located between and bonded to the adjacent surfaces of the panel sheets to secure the sheets together, a boundary sealing strip of compressible material having a normal thickness greater than the spacing between the panel sheets maintained by the core means, the boundary strip being compressed between and bonded to the panel sheets and extending around the perimeter of the panel sheets but offset from the edges of the panel sheets to provide space for the frame members to fit between the panel sheets, and a plurality of clips positioned at spaced intervals around the perimeter of the respective panel sheets, each clip having two parallel portions joined by a connecting portion, one parallel portion of each clip engaging the edge of a panel sheet, the other parallel portion lying against the boundary strip, and the connecting portion engaging the inner surface of the panel sheet, said other parallel portion of the clips engaging a frame member to transfer any load extending parallel to the panel surface between the panel and the framework.

4,373,314

MASONRY VENEER WALL ANCHOR

Jack A. Allan, Palos Hills, Ill., assignor to AA Wire Products Company, Chicago, Ill.

Filed Dec. 10, 1981, Ser. No. 329,243
Int. Cl.³ E04B 1/41
U.S. Cl. 52—434 **9 Claims**



1. For use in a masonry wall veneer tie construction, a unitary wall anchor comprising,

first and second integrated rectangularly shaped leg components or coextensive length,

each having ends spaced apart from one another in the direction of a vertical axis and

each having a first longitudinal edge which is common to both thereby to form a corner joint, and

each having a second longitudinal edge which is spaced from said first edge and disposed in respective offset planes intersecting at said corner joint,

said first leg component having means for fastening said anchor with said first leg component in overlying relation to an adjoining architectural member,

said second leg component having elongated slot means formed therein inwardly of its edges and bounded longitudinally by ends and bounded laterally by inner and outer sides extending in parallelism to said vertical axis,

said slot means being sized to receive a tie means inserted therein in vertical sliding adjustment,

the respective inner and outer sides of said slot means being engageable with the tie means for transmitting both pulling and pushing forces to the adjoining architectural member over the entire area of said overlying first leg component.

4,373,315

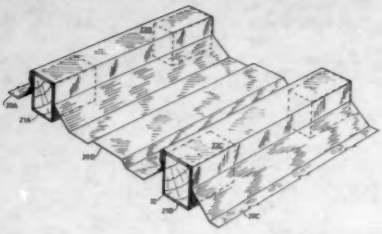
BUILDING ELEMENTS AND BUILDING METHODS

Herbert H. Farrant, Massey, New Zealand, assignor to John Kenneth Burrowes, Auckland, New Zealand

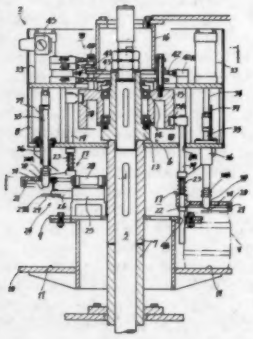
Filed Mar. 13, 1980, Ser. No. 130,170
Claims priority, application New Zealand, Mar. 14, 1979, 189900
Int. Cl.³ E04D 1/00
U.S. Cl. 52—522 **1 Claim**

1. A building structure comprising: two or more sheet building elements, each of said elements including a sheet of substantially rigid material having complementary interlocking means at or adjacent a pair of lateral edges thereof, a first of said interlocking means consisting of a substantially rectangular open topped trough having a flat base, and a second of said interlocking means consisting of an inverted substantially rectangular trough having a flat top and an open base, and clip means formed in said complementary means, whereby adjacent sheet building elements are conjoined by overlapping their adjacent edges so that a first and a second interlocking means are combined to form a substantially weather tight hollow substantially rectangular box section member to which linings or strappings can be attached by fasteners without damaging the weather tightness or integrity of the profile; and timber

elements provided within said hollow substantially rectangular box section to pass through either of said sheet building elements into said timber elements for connection with a supporting framework.



4,373,316
PLUG DRIVING APPARATUS
Takanobu Kobayashi, Katano, Japan, assignor to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan
Filed Sep. 5, 1980, Ser. No. 184,530
Int. Cl.³ B67B *1/04*; B65B *7/28*
U.S. Cl. 53—67 **13 Claims**



1. A plug driving apparatus comprising:
a vertical shaft;
an annular rotary receiver stand mounted on said shaft and having a plurality of container placing portions in a circular arrangement;
a plurality of plug driver heads each disposed above one of the container placing portions and having an end portion for retaining a plug, each driver head being vertically movable by first cylinder means between an upper stand-by position, an intermediate plug receiving position and a lower plug driving position;
plug pick-up means provided at each container placing portion, each plug pick-up means being linearly extendable and retractable by second cylinder means to and from a position right beneath a corresponding driver head;
fixed plug feeder means for successively feeding plugs to said plug pick-up means;
container positioning means provided at each container placing portion and comprising a downwardly and upwardly movable centering head having at the outer periphery thereof a holding portion adapted to fit, from above, around the outer periphery of the top portion of a container, the centering head having a hole in the central portion thereof for allowing the passage therethrough of a corresponding driver head; and
cam means disposed around the vertical shaft, said cam means comprising a first cam track for controlling the vertical movement of each driver head by the first cylinder means, a second cam track for switching the working pressure of the first cylinder means between low pressure operation to the intermediate plug receiving portion and high pressure operation to the lower plug driving position, a third cam track for extending and retracting the individual plug pick-up means by the second cylinder means, and a fourth cam track for vertically moving the centering heads of the positioning means.

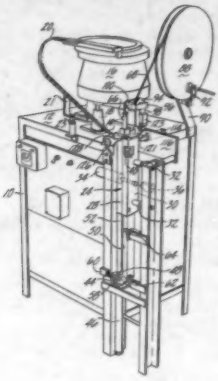
4,373,317
CONTAINER WITH LID
Alwin Egli, Beringen, Switzerland, assignor to Platmanufaktur AB, Malmo, Sweden
Division of Ser. No. 970,339, Dec. 18, 1978. This application Jun. 2, 1980, Ser. No. 155,403
Claims priority, application Sweden, Jan. 2, 1978, 7800006
Int. Cl.³ B65B *61/18, 7/28*
U.S. Cl. 53—412 **14 Claims**

1. A method of forming an openable closure for a container comprising folding a blank of material to form an inner lid element having a flat bottom and a frame along at least two sides of said bottom, placing said inner lid element into an open end of a filled container with the bottom of the inner lid element facing into the container and the frame releasably bearing against the inner surfaces of the side walls of the container, joining a blank of material for an outer lid element with the frame of the inner lid element and joining the outer lid element to the container with a separable connection to enable separation of the outer lid element from the container together with removal of the entire inner lid element from the container to provide access to the interior of the container.

4,373,318
STACKING DEVICE FOR HOLLOW RIVETS
John Powderley, Birmingham, and David J. Brookes, Sutton Coldfield, both of England, assignors to USM Corporation, Farmington, Conn.
Filed Jun. 26, 1980, Ser. No. 163,216
Int. Cl.³ B65B *35/50, 27/06, 13/08*
U.S. Cl. 53—540 **11 Claims**

1. A stacking device suitable for use in stacking headed tubular fasteners in a column one-above-the-other head to tail, the device comprising feeding means including a substantially horizontal guide to which the fasteners are advanced one after the other with their shanks substantially vertical, a collector which defines a substantially vertical passage which has its upper end adjacent an open exit end of the guide so that fasteners leaving the guide through the exit end fall into the passage, the passage having transverse dimensions such that fasteners falling into the passage are constrained to form a column one-above-the-other with their shanks substantially in alignment, and air blowing means including a nozzle positioned adjacent the guide so that, when air is blown through the nozzle, the fastener nearest the exit end of the guide is caused to accelerate relative to the other fasteners in the guide and is thereby separated from said other fasteners to fall into the passage, means

associated with the vertical passage of said collector, for packaging a column of stacked fasteners, said packaging means



comprising means for moving a mandrel upwardly, longitudinally through a column of fasteners formed in the passage.

4,373,319

RECORD BAGGING

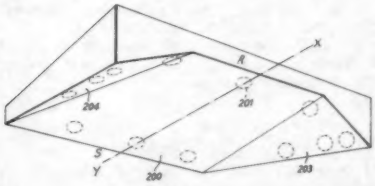
Geoffrey J. Pullen, Hayes; John A. Pemberton, New Denham, and Colin J. Brown, London, all of England, assignors to EMI Limited, Hayes, England

Filed Aug. 8, 1980, Ser. No. 176,592

Claims priority, application United Kingdom, Aug. 18, 1979, 7928834

Int. Cl.³ B65B *5/04, 43/14, 43/44, 43/54*

U.S. Cl. 53—573 5 Claims



1. An apparatus suitable for use in a record transfer press for holding a record bag in a substantially horizontal position suitable for insertion therein of a disc record transferred thereto by a record transfer means, said apparatus comprising a plate means adapted to hold a bag so that the lower side thereof is everywhere unsupported and is spaced apart from the upper side, wherein the lower surface of the plate means has suction means, said plate means defining an axially extending channel having a first record receiving end and a second opposite end and having a progressively varying depth from said first end to said second opposite end, the shaping being such that when the upper side of a bag is caused by the suction means to conform to the lower said surface the shortest distance between the opposed closed edges of the bag is greater than the diameter of the disc record to be inserted therein, the other, closed edge of the bag being accommodated at or close to said second opposite end.

4,373,320

PACKING LINE FOR PACKING STACKS OF RECTANGULAR TINPLATE SHEETS ON PALLETS

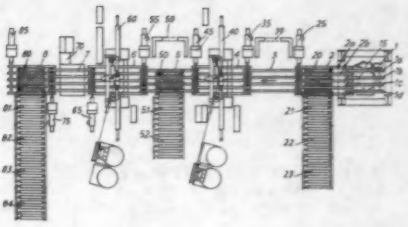
Jan Olivierse, Velsen-Noord, and Machiel A. H. van Ee, Beverwijk, both of Netherlands, assignors to Hoogovens IJmuiden B.V., IJmuiden, Netherlands

Continuation of Ser. No. 48,818, Jun. 15, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 257,181

Claims priority, application Netherlands, Jun. 21, 1978, 7806682

Int. Cl.³ B65B *13/04*

U.S. Cl. 53—589 5 Claims



1. Packing line for packing stacks of rectangular tinplate sheets on pallets having bottom parallel runners, comprising

(a) a continuous conveyor path for said palletized stacks comprised of a path of a plurality of chain conveyors arranged end-to-end but with the ends of each chain conveyor overlapping the ends of its adjacent chain conveyor and at least one roller conveyor, each said chain conveyor over at least a portion of said chain conveyor path having at least three parallel endless spaced chains each with upper and lower runs moving parallel to the travel direction of the stack, the upper run providing a support surface for the palletized stacks with the pallet runners extending transversely to said chain conveyors path,

(b) a first one of said chain conveyors being a collector station at which successively said palletized stacks are formed on the pallets, the said first conveyor being vertically movable and rotatable about a vertical axis through at least 90° so as to be capable of turning a stack through 90°, the end of said first chain conveyor being independent of the end of the adjacent overlapping chain conveyor,

(c) a first manual workstation in said conveyor path at which manual packing operations are performed on the stacks,

(d) a second one of said chain conveyors being located before said manual workstation and after said first chain conveyor in the direction of travel of the stack,

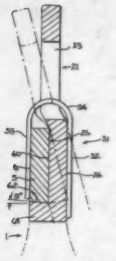
(e) a third one of said chain conveyors located at said manual workstation,

(f) a fourth one of said chain conveyors,

(g) a strapping machine adapted automatically to apply straps transversely of the conveyor path around a palletized stack partially packed at said manual workstation, said strapping machine being located adjacent said fourth one of said chain conveyors, in the direction of travel of the palletized stacks, and

(h) a branch roller conveyor which is liftable to move one of its rollers between each two adjacent parallel chains and above the upper runs to enable palletized stacks to be moved into and out of the chain conveyor path, said roller conveyor positioned after said collector station and before said first manual packing station.

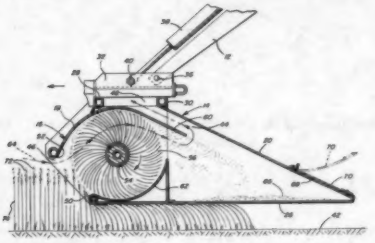
4,373,321
SAFETY STIRRUP
James P. Prendergast, 29 MacFarlan St., South Yarra, 3141, Victoria, Australia
Continuation-in-part of Ser. No. 952,094, Oct. 17, 1978, abandoned. This application Mar. 20, 1981, Ser. No. 246,002
Int. Cl.[3] B68C *3/00*
U.S. Cl. 54—49 10 Claims



1. A stirrup safety device comprising:
a stirrup having a planar surface on the side of the bight thereof, said stirrup having an edge adjacent said planar surface:
a support for said stirrup having a plate-like portion with a planar surface and a portion adapted to receive a stirrup leather, said planar surface of said support being abuttable along only one side of said bight at the planar surface thereof; said plate-like portion of said stirrup support having a lip lying generally normal to the plate-like portion, the length of said lip corresponding generally to the thickness of said stirrup bight, said stirrup being positionable on said support with said edge resting on said lip and said planar surfaces in abutment; and
biasing means in the form of a U-shaped spring clip having two legs and a joinder portion, one of said legs contacting the bight of said stirrup and terminating short of said lip, the other of said legs contacting the plate-like portion of said support for biasing said planar surfaces of said stirrup and support into abutment with said lip and said edge in engagement so that said stirrup depends from said support, said biasing means being separable from said support and said stirrup,
said safety device being constructed and arranged such that in normal use with force applied to the stirrup by a rider, the stirrup will be supported by the support but such that when forces are applied to the stirrup at an angle to the support, the stirrup and support will pivot relative to one another against the biasing means until disengagement of the lip and the edge occur, whereupon the stirrup becomes separable from the support.

4,373,322
FLAIL-VACUUM SEED HARVESTER
Victor A. deisel, Rte. 1, Fargo, Okla. 73840
Filed Sep. 14, 1981, Ser. No. 302,168
Int. Cl.[3] A01D *45/30*
U.S. Cl. 56—126 6 Claims

1. A flail-vacuum seed and grain harvester, said harvester including an elongated horizontal housing adapted to be horizontally laterally advanced against a seed or grain crop and defining front and rear longitudinal sides and opposite ends, said housing including a pair of vertically spaced and registered downwardly concave and upwardly concave upper and lower generally partial cylindrical members, each of less than 180° in angular extent, extending between said ends and including corresponding front and rear arc end marginal portions extending longitudinally of said housing, the spacing between said partial cylindrical members defining a front-to-rear extending passage in said housing having an inlet end disposed between said front arc end marginal portions and an outlet end disposed between said rear arc end marginal portions, an elongated seed stripping rotary brush journalled in said housing between and extending longitudinally of said partial cylindrical members and including bristle ends which sweep across the opposing concave sides of said partial cylindrical members, the forward arc end portion of said upper partial cylindrical member diverging outwardly from the cylindrical path through which the outer periphery of said brush swings, the rear arc end portion of said upper cylindrical member including an extension extending generally tangentially rearwardly and downwardly from said path at an elevation spaced above the rear arc end of said lower partial cylindrical member, said housing including a longitudinally extending rear portion thereof disposed rearwardly of the axis of rotation of said brush and which is generally horizontal V-shaped in cross

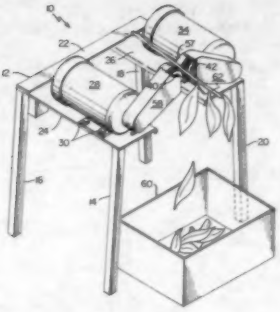


section and opens forwardly toward said brush, the free ends of the diverging leg portions of said horizontal V-shaped rear portion being generally horizontally aligned with the upper and lower peripheries of said brush, said tangential extension projecting into said rear portion and being spaced below and generally paralleling the upper leg portion thereof, the spacing between said extension and said upper leg portion comprising an outlet slot from said rear portion of said housing, motor means drivingly connected to said brush for rotating the latter in a direction with the lower periphery thereof moving forwardly and upwardly across said inlet, said outlet opening into the rear portion of said housing below said extension, said forward arc end of said upper partial cylindrical member being disposed forward of and above the forward arc end of said lower partial cylindrical member, the lower leg of said horizontal V-shaped rear housing portion comprising a support surface for harvested seed or grain.

4,373,323
TOBACCO LEAF STRIPPER
Thomas F. Jones, Maysville, Ky., assignor to Tobacco Machinery Co. of Ky. Inc., Maysville, Ky.
Filed May 11, 1981, Ser. No. 262,601
Int. Cl.[3] A01D *45/16*
U.S. Cl. 56—27.5 9 Claims

1. A tobacco stripper for removing dried and cured tobacco leaves from a tobacco stalk severed from the ground, comprising:
(a) a base;
(b) at least four radially spaced and aligned rotatable pulleys having parallel axes of rotation supported upon said base;
(c) a pair of radially aligned counter-rotating endless belts rotatably carried by said pulleys, at least two of said pulleys engaging the interior surface of each of said belts, said belts have a plurality of impact teeth on their exterior surfaces, said teeth being separated from each other in the direction of belt movement by an interposed spacing adapted to accommodate the diameter of a tobacco stalk, said teeth and interposed spacing extending transversely across the entire width of the belts in a direction substantially perpendicular to the direction of belt movement, at

least one pulley engaging the interior surface of each belt, said at least one pulley being separated to form a spaced nip between the belts adapted to accommodate a tobacco stalk; and



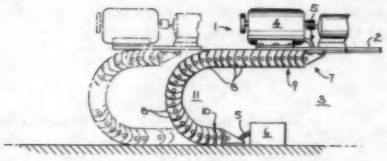
(d) drive means associated with at least one pulley engaged with each belt, said drive means being operative to produce counter-rotating movement of said belts.

4,373,324

GUIDE APPARATUS FOR FLEXIBLE ELEMENTS CONNECTED TO RELATIVELY MOVING UNITS

Alfred G. Janos, Hustisford, Wis., assignor to Maysteel Corporation, Mayville, Wis.

Filed Sep. 2, 1980, Ser. No. 182,863
Int. Cl.³ F16G *13/16*
U.S. Cl. 59—78.1 **21 Claims**



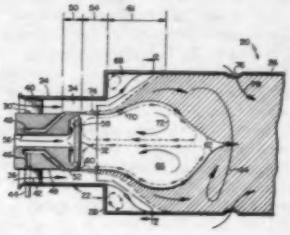
1. A self-supportive guide duct apparatus for guiding elongated flexible elements connected between a pair of laterally displaced relatively moving devices with a fixed bending radius, comprising a series of tubular duct elements including substantially parallel end walls and interconnecting substantially parallel side walls and defining a continuous articulated tubular duct enclosure for receiving of said elongated flexible elements, first and second spaced pivot support means secured to said side walls for pivot connection of adjacent duct elements, said duct elements being mounted in telescoped relations with the opposite pivot support means aligned and connected to pivotally support adjacent telescoped duct elements, the telescoped duct elements having interfitting end walls and side walls, and said side walls including interior stop wall means arranged and oriented to permit relative limited pivotal movement from an in-line position in one direction only and establishing interior interference surfaces preventing pivotal movement in the direction opposite said one direction from said in-line position, the exterior walls of said telescoping duct portions and the adjacent opposed interior walls being constructed and shaped to define complementing curved surfaces establishing close fitting spaced telescoping portions during pivotal movement to maintain an essentially continuous tubular enclosing guide for the elongated flexible elements.

4,373,325

COMBUSTORS

Jack R. Shekleton, San Diego, Calif., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 7, 1980, Ser. No. 128,360
Int. Cl.³ F23R *3/14, 3/30*
U.S. Cl. 60—39.06 **53 Claims**



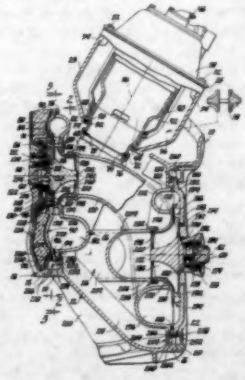
1. A method of effecting the stable, nonluminous combustion of a liquid fuel which comprises the steps of: generating an annulus of axially moving, rotating combustion air; forming a thin, uniform film of fuel on the inner boundary of said annulus at a specified location therealong; atomizing said fuel by contact between said fuel and said combustion air only after said film has been formed on the inner boundary of said annulus and so as to form a stratified annulus of small fuel droplets which resist centrifuging into the swirling annulus of combustion air; thereafter rapidly expanding said stratified annuli of combustion air and fuel droplets to promote the mixing and subsequent combustion of said fuel and air and then so effecting a downstream contraction of the swirling fuel-air mass as to effect the formation of a recirculation zone containing hot gases which stabilize the flame generated by the combustion of the fuel and air and so ignite the fuel as to effect evaporation and heating of the fuel before said stratified annuli of atomized fuel and rotating combustion air are rapidly expanded to promote the mixing of said fuel with the combustion air.

4,373,326

CERAMIC DUCT SYSTEM FOR TURBINE ENGINE

Charles H. Smale, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1980, Ser. No. 199,587
Int. Cl.³ F02C *3/10*
U.S. Cl. 60—39.161 **4 Claims**



1. In a gas turbine engine having a metal engine block for

housing a gear train, a combustor, a gasifier spool with a gasifier turbine rotor and a power turbine spool with a turbine rotor, the improvement comprising: first ceramic housing means defining a gasifier turbine rotor chamber, said first ceramic housing means having a center outlet duct and a curved inlet duct segment thereon wrapped around said center outlet duct and inclined with respect to the axis of the gasifier spool and adapted to be connected to the outlet of the combustor for supplying motive fluid to the gasifier spool, a second ceramic housing means defining a chamber for a power turbine rotor located to arrange the axis of the power turbine spool at a point offset from the axis of the gasifier spool, said second ceramic housing means having an inlet duct conformation thereon fit within said curved inlet duct segment and connected to said center outlet duct to bridge the offset distance between the axes of the gasifier spool and the power turbine spool and including a center outlet, said inlet duct conformation having a reduced axial flow length therethrough to reduce pressure loss as motive fluid passes from the gasifier turbine to the power turbine, and means to connect the first and second ceramic housing means to said metal engine block to isolate the supported ceramic components from mechanical and thermal loading during operation of the gas turbine engine.

4,373,327

GAS TURBINE ENGINE COMBUSTION CHAMBERS

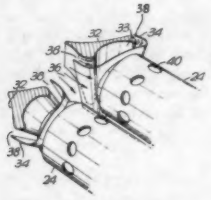
Richard C. Adkins, Milton Keynes, England, assignor to Rolls-Royce Limited, London, England

Filed Jun. 27, 1980, Ser. No. 163,481

Claims priority, application United Kingdom, Jul. 4, 1979, 7923319

Int. Cl.³ F02C *3/14*

U.S. Cl. 60—39.37 **8 Claims**



1. A gas turbine engine combustion system comprising:

an annular housing defined by inner and outer annular walls;

a plurality of combustion chambers equi-spaced apart and circumferentially arranged within said annular housing, each of said combustion chambers having an upstream and a downstream end;

a diffusion passage upstream of the upstream ends of said combustion chambers, said diffusion passage including inner and outer annular walls connected respectively to said inner and outer annular walls of said annular housing, said inner and outer walls of said diffusion passage converging in an upstream direction and arranged to receive a flow of compressed air; and

a plurality of aerodynamic struts extending between said inner and outer walls of said diffusion passage, each of said struts being adjacent to and upstream of and in alignment with a respective one of said combustion chambers, each of said struts being wedge-shaped in plan form and having an upstream apex, a downstream base spaced from the upstream apex of the respective one of said combustion chambers and sidewalls extending the full height of said diffusion passage, each of said struts having a circumferential width and radial height increasing from the apex thereof in a downstream direction to the base thereof whereby said diffusion passage increases in radial height and decreases in circumferential width in a downstream direction so as to decrease diffuser area ratio.

4,373,328

THRUST REVERSER

Robert A. Jones, Madison, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 22, 1980, Ser. No. 199,403

Int. Cl.³ F02K *3/06*; B64C *15/06*

U.S. Cl. 60—226.2 **4 Claims**

1. A thrust reverser for a fan jet engine supported in a nacelle of an aircraft having an annular passageway for conducting flow discharging from the fan, splitter means in said passageway cooperating with the walls of said annular passageway cooperating with the walls of said annular passageway for defining coaxial passages for dividing said flow into two coannular streams, a cascade coaxially disposed relative to said splitter, said nacelle having a slidable annular structure nesting said cascade and moveable to expose it to said passageway for reversing the flow of fan discharge air into ambient for thrust reversal, means attaching said splitter to said annular structure for moving said splitter in the same direction as said annular structure, said splitter having one end contoured to bear against the inner wall of said annular passageway in the deployed position for blocking the flow of the inner coannular stream of said coannular streams and blocker door means moveable with said slideable annular structure to a flow blocking position for blocking the flow of the outer of said coannular streams whereby the flow discharging from said fan is diverted to flow through said cascade.

4,373,329

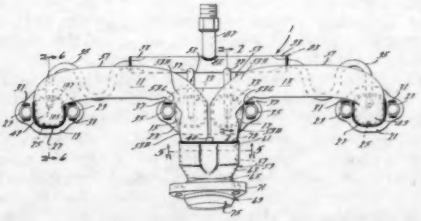
TUBULAR EXHAUST MANIFOLD

Alfred R. G. Martini, Grass Lake, Mich., assignor to Tenneco Inc., Bannockburn, Ill.

Filed Jun. 30, 1980, Ser. No. 164,603

Int. Cl.³ F01N *3/34, 7/10*

U.S. Cl. 60—305 **17 Claims**



1. A fabricated metal exhaust gas manifold for an internal combustion engine, said engine having separate four in line exhaust gas ports for four different cylinders opening out of an outer surface of the engine, said manifold defining a compact envelope having a length corresponding to the distance between the first and last of said gas ports and a width and a height that are significantly less than said length and comprising a collector member having an outlet bushing for connection to an exhaust pipe and an internal exhaust gas collecting and mixing chamber in gas flow communication with said

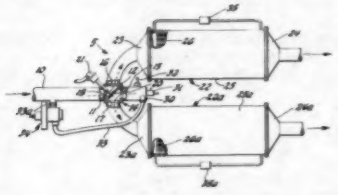
outlet, a pair of outer long pipes and a pair of inner short pipes having outlet ends bunched together inside said collector member with their outlet ends opening into said chamber, first means uniting said collector member and outlet ends in a rigid and gas-tight manner, said pipes extending away from said collector member and curving substantially 90° away from said collector member and spaced from one another so that they may be connected to different exhaust gas ports, said long pipes extending to the first and last of said four in line gas ports and said short pipes extending to the second and third of said gas ports, said pipes having inlet ends each adapted to receive gas from an exhaust gas port, and second means including a plurality of separate flanges mounted on said inlet ends for removably attaching the pipes to the outer surface of an engine in gas flow communication with the exhaust gas ports, said collector member being substantially tubular and said flanges being substantially flat and coplanar, said outlet ends and said collector member extending in a direction substantially parallel to the plane of said flanges, the outer ends of said inner short pair of pipes being adjacent to said plane and the outlet ends of said outer long pipes being spaced away from said plane by the outlet ends of said short pipes.

4,373,330

DIESEL ENGINE DUAL PATH EXHAUST CLEANER AND BURNER SYSTEM

Terrence L. Stark, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 29, 1981, Ser. No. 278,088
Int. Cl.³ F01N 3/02
U.S. Cl. 60—311 **3 Claims**



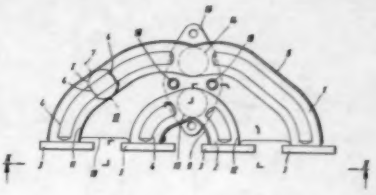
1. A dual path exhaust cleaner and burner system for use with a diesel engine, said system including an exhaust passage for receiving spent combustion products exhausted from the engine; a four-way valve means having a first inlet connected to said exhaust passage, said valve means also having a second inlet opposite said first inlet and opposed first and second outlets with a movable valve for the selective control of flow from said first and second inlets to said first and second outlets; a secondary passage means connected to said second inlet; first and second housing means each having a gas inlet connected to said first and second outlets, respectively, and each having a gas outlet therefrom; first and second particulate trapping filter means of combustion resistant material operatively positioned in said first and second housing means, respectively; heating means operatively associated with said particulate trapping filter means to effect the incineration of particulates collected thereon during operation of the engine; and, a regulated flow exhaust passage means, including a constant flow valve means, connected at one end to said secondary passage means and connectable at its opposite end to said exhaust passage whereby a constant predetermined flow of exhaust gas, as controlled by said constant flow valve means, can be supplied to one of said particulate trapping filter means so as to effect a controlled complete incineration of particulates thereon.

4,373,331

MANIFOLD ON AN INTERNAL COMBUSTION ENGINE

Andres Santiago, and Enrique Santiago, both of Dinderf, Fed. Rep. of Germany, assignors to Zeuna-Staerker GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 4, 1980, Ser. No. 184,091
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2935926; Nov. 8, 1979, 2945079
Int. Cl.³ F01N 7/10
U.S. Cl. 60—323 **9 Claims**



1. A manifold for an internal combustion engine for conducting exhaust gases from the engine to exhaust piping, said manifold comprising:

two half shells;

each half shell shaped such that when welded to the other half shell pipe lines are defined which lead from each exhaust gas port of the engine, and at least one flat web is defined between said pipe lines;

each half shell comprising two steel sheets overlaying one another, at least the sheet to be positioned adjacent the other half shell being comprised of non-scaling steel, and a thin insulating layer of a compressible, heat resistant material between said sheets only in the areas where said pipe lines are to be defined;

said half shells and said two steel sheets of each half shell all being welded together along the edges of the pipe lines and at a plurality of points in said web;

said pipe lines thereby being comprised of an upper wall portion defined by one half shell and a lower wall portion defined by the other half shell, said web thereby being comprised of flat portions of both half shells welded together at least at their respective edges where said pipes are defined and mutually supporting one another.

4,373,332

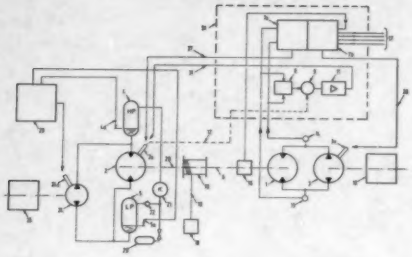
MOVEMENT COMPENSATION ARRANGEMENT

Hans K. Holmen, Sandvika, Norway, assignor to A/S Tele-Plan, Lysaker, Norway

Filed Jan. 23, 1980, Ser. No. 114,774
Claims priority, application Norway, Jan. 31, 1979, 790311; Apr. 24, 1979, 791356
Int. Cl.³ F15B 9/17
U.S. Cl. 60—426 **12 Claims**

1. An arrangement for compensating for undesired movements of a load relative to a station, comprising an element which is adapted to be coupled to the load by a force-transmitting member and is mounted on the station so as to be movable with respect thereto; first and second hydropneumatic pressure containers, and a main hydraulic machine of variable displacement and operable both as a motor and as a pump and connected to the containers so that in its motor mode of operation it is driven by flow of fluid under pressure from the first container to the second container and in its pump mode of operation it pumps fluid from the second container into the first container, means which couple drivingly the hydraulic machine and the movable element for moving the movable element so as to maintain control of the force exerted on the element by the load through the force-transmitting member upon movement of the load; an auxiliary hydraulic machine including a motor device which is coupled drivingly to the

movable element and a pump device which is in fluid communication with the motor device, the pump device having a variable power output; a load position sensor and a control unit connected to the hydraulic machines for controlling the displacement of the hydraulic machines in response to input signals received thereby from the hydraulic machines and from the load position sensor, and the control unit being also connected to the pump device for controlling the power output therefrom, one input signal to the control unit being representative of the pressure difference across said pump device; and the main hydraulic machine in operation provides static compensation whereby the pump device and motor device provide dynamic compensation and thereby obtain a controlled position of the load.

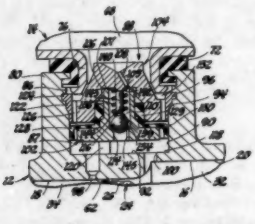


4,373,333

QUICK TAKE-UP MASTER CYLINDER WITH CHECK VALVE ASSEMBLY

John R. Coleman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1981, Ser. No. 296,884
Int. Cl.³ B60T *11/08;* F16K *15/04*
U.S. Cl. 60—578 1 Claim



1. In a quick take-up master cylinder having a reservoir, first and second pressurizing chambers respectively provided with first and second pistons for pressurizing brake fluid therein, said first pressurizing chamber being a low pressure high volume displacing chamber and said second pressurizing chamber being a high pressure low volume displacing chamber, a compensation control and blow-off valve unit wherein the blow-off valve thereof is a check valve assembly having a valve body, a valve chamber formed in said body and defined by spaced end walls and a side wall, an inlet port in continuous fluid communication with said first pressurizing chamber and opening through one of said end walls into said valve chamber to define a valve seat therein, a ball check valve in said valve chamber normally seated on said valve seat, a compression coil spring in said valve chamber having one spring end seated on the other of said end walls and the other spring end engaging said ball check valve, said coil spring urging said ball check valve toward said valve seat, and an outlet port in said valve body providing continuous communication from said valve chamber to said fluid reservoir, said first piston when moved in the actuating direction generating a quick take-up pressure in said first pressurizing chamber initially transmitted to said second pressurizing chamber and at a predetermined pressure opening said ball check valve and thereafter desirably causing a high fluid flow at a predetermined low noise level through said input port and said outlet port to said reservoir;

means for reducing fluid flow noise and fluid flow restriction within said valve chamber when fluid pressure from said first pressurizing chamber opens said ball check valve by compressing said coil spring to allow the desired fluid flow from said inlet port through said valve chamber and said outlet port, said means including

a ball check valve opening movement limiting device extending from said check valve chamber other end wall into said coil spring and in alignment with said ball check valve but spaced from said ball check valve when said ball check valve is seated on said valve seat, and engaged by said ball check valve upon a predetermined limited amount of ball check valve opening movement to prevent sufficient compression of said coil spring which would otherwise cause the coils thereof to incipiently become a solid stack and generate a fluid flow noise exceeding said predetermined low noise level because of the proximity of the coils to each other, and further so that the desired fluid flow can flow through the coils of said spring within said valve chamber due to the reduction in fluid flow restriction;

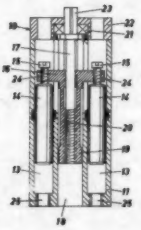
said outlet port being offset from the axis of said limiting device and said coil spring so that the end of the outlet port at said valve chamber is positioned radially outside the spring seating portion of said other end wall, thereby to further reduce fluid flow restriction by providing a fluid flow path from said inlet to said outlet outside said coil spring.

4,373,334

DEVICE FOR VARIABLE HEIGHT ADJUSTMENT OF SUPPORTS

Lars E. Carlander, Kransvägen 112, Boras, Sweden (502 51)

Filed Sep. 25, 1948, Ser. No. 190,211
Claims priority, application Sweden, Sep. 26, 1979, 7907974
Int. Cl.³ B60T *7/02;* F01B *3/00*
U.S. Cl. 60—594 2 Claims



1. An adjustment means for variable height adjustment of fluid pressure operable supports, e.g. legs to vertically adjustable tables, chairs, beds etc., comprising, a cylindrically shaped housing member, a central bore in said housing and coaxial therewith, a number of individual cylindrical pressure chambers within said housing radially spaced outwardly with respect to and extending parallel to said central bore and circumferentially spaced equidistantly with respect to each other, the number corresponding to the number of supports, a piston in each pressure chamber adapted for reciprocation therein, a driving nut unrotatably but axially displaceably mounted in the housing, said axial displacement being parallel to the reciprocation of said pistons, an internally screw threaded bore in said driving nut, a screw threaded spindle rotatably mounted in the

housing, said screw threaded bore and spindle being in operative engagement so that rotation of said spindle axially displaces said driving nut, an individual adjusting screw for each piston threadedly mounted in said driving nut so that the inner end of each screw operatively engages one end of the respective piston, an elongated sleeve shaped guide member on said driving nut having an internal screw thread thereon cooperatively engaging the screw threads on said spindle, said guide member extending coaxially in said central bore from said nut between said pressure chambers and being guided for axial displacement in said central bore, means for connecting said spindle to a drive means, and a connection means in said housing communicating with each pressure chamber at the other end of each piston to facilitate connecting each pressure chamber by a conduit means to one of said fluid pressure operable supports so that when so connected with said conduit means, pressure chambers and supports containing a fluid pressure medium, rotation of said spindle will displace said pistons axially in said cylinders to operate said supports and said individual adjusting screws can operate each piston with respect to each other and each respective support with respect to the other supports.

4,373,335

SUPERCHARGE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

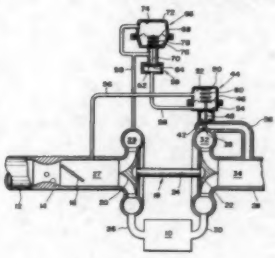
Yasushi Kuribayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 3, 1980, Ser. No. 193,454

Claims priority, application Japan, Oct. 5, 1979, 54-137420[U]

Int. Cl.³ F02B *37/12*

U.S. Cl. 60—602 **2 Claims**



1. A supercharge system of an internal combustion engine including an intake passageway having a throttle valve therein, and an exhaust passageway, the supercharge system comprising:

a turbosupercharger having a turbine disposed in the exhaust passageway so as to be driven by exhaust gas of the engine, and a compressor disposed in the intake passageway downstream of the throttle valve and connected with said turbine so as to be driven by said turbine to force air into the engine at a pressure higher than the atmospheric pressure;

an exhaust bypass passage which branches from the exhaust passageway at a portion upstream of said turbine and joins the exhaust passageway at a portion downstream of said turbine so as to bypass said turbine;

an exhaust bypass valve for selectively opening and closing said bypass passage;

a bypass valve actuating device having a first pressure chamber, a second pressure chamber, a flexible diaphragm connected to said bypass valve and separating said first and second pressure chambers from each other, said diaphragm being movable into such a first position that said bypass valve opens said bypass passage and into such a second position that said bypass valve closes said bypass passage, and a return spring for biasing said diaphragm in such a direction that said bypass valve closes said bypass passage;

a first passage for providing communication between said first pressure chamber and a first portion of the intake passageway which is located downstream of the throttle valve between the throttle valve and said compressor;

a second passage for providing communication between said second pressure chamber and a second portion of the intake passageway which is located downstream of said compressor; and

a pressure difference adjusting valve for adjusting the difference between the pressures in said first and second pressure chambers such that said bypass valve is opened when the pressure in said first portion of the intake passageway is below a first predetermined value and when the pressure in said second portion of the intake passageway is above a second predetermined value which is higher than said first predetermined value, and that said bypass valve is closed when the pressure in said first portion is above said first predetermined value and the pressure in said second portion is below said second predetermined value, said pressure difference adjusting valve comprising:

a valve member for selectively opening and closing said second passage, and

a valve member actuating device comprising:

a third chamber communicating with said second portion,

a fourth chamber communicating with the atmosphere,

another flexible diaphragm connected with said valve member and separating said third and fourth chambers from each other, said another diaphragm being movable into such a third position that said valve member closes said second passage and into such a fourth position that said valve member opens said second passage, and

a return spring for biasing said another diaphragm such that said another diaphragm is moved in response to the difference between the pressures in said third and fourth chambers into said third position to stop the feed of the pressure in said second portion to said second pressure chamber when the pressure in said second portion is below said second predetermined value and into said fourth position to effect the feed of the pressure in said second portion to said second pressure chamber when the pressure in said second portion is above said second predetermined value.

4,373,336

INTERNAL COMBUSTION ENGINE HAVING A TURBO-SUPERCHARGER WITH AN AUTOMATIC BYPASS

Hansulrich Hörler, Zurich, and Erwin Meier, Remetschwil, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 20, 1979, Ser. No. 105,774

Claims priority, application Switzerland, Jan. 31, 1979, 923/79

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—606 **2 Claims**

1. In an internal combustion engine of the type having a turbocharger compressor connected to an engine charge air intake manifold and a waste gas turbine connected to an engine waste gas manifold, an automatic bypass including a bypass line interconnecting, firstly, said waste gas manifold upstream of the waste gas turbine and, secondly, said air intake manifold downstream of said compressor, and bypass valve means in said bypass line comprising a valve seat, an adjustable valve body defining with said seat a throttle member for adapting the quantity of bypassed gas to the prevailing operating state of the engine, a movable piston rod having a first end adjacent said air intake manifold and to which said valve body is connected, and an actuating piston operably connected to said piston rod and responsive to pressures in the bypass line for moving said valve body, the improvement wherein:

said piston rod includes a second end remote from said air

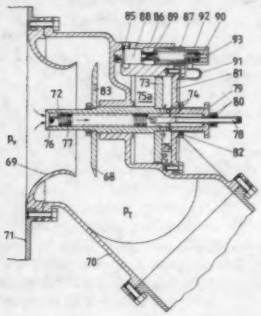
intake manifold, said actuating piston disposed on said second end,

said throttle means defining means for resisting gas flow from the compressor side to the turbine side substantially less than from the turbine side to the compressor side,

said valve body being urged to an open condition when the pressure at said compressor side of said bypass valve is within a range below a selected pressure value under load conditions and above a pressure value existing under conditions of engine idling,

means for communicating said actuating piston with the pressure at said compressor side of said bypass line to move said valve body from a valve open position to a valve closed position in response to pressures above said selected value at said compressor side,

an adjustable stop element provided for adjustably limiting the stroke of said valve body in a valve opening direction, said valve body disposed in engagement with said valve seat in said valve closed position,



said piston rod being hollow and including transverse bores for connecting the charge air intake manifold with a space behind said actuating piston,

a spring for urging said valve body open, said spring comprising a helical tension spring, one end of said spring connected to said piston rod, and another end of said spring fixed to a threaded element operably connected to said spring and being adjustable to vary the prestress of said spring,

said threaded element comprising a threaded spindle, a threaded bushing mounted for adjustment along the axis of said piston rod, a first nut threadedly mounted on said bushing to locate the latter, said spindle extending through said bushing, a second nut threadedly mounted on said spindle and abutting said bushing to locate said spindle, said bushing defining said stop element for limiting the stroke of said valve body.

4,373,337

TURBOCHARGED INTERNAL COMBUSTION ENGINE WITH SPARK IGNITION

Wolfgang Widmann, Ludwigsburg, Fed. Rep. of Germany, assignor to Daimler-Benz A.G., Stuttgart, Fed. Rep. of Germany

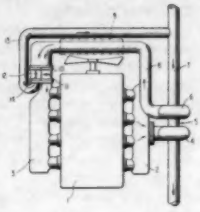
Filed Aug. 18, 1980, Ser. No. 179,258

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933556

Int. Cl.³ F02B 37/00

U.S. Cl. 60—611 **5 Claims**

1. An internal combustion engine with spark ignition, the engine including an exhaust gas turbocharger means for supplying supercharging air to the engine, a charging air line means for conveying supercharging air to an intake manifold of the engine, a throttle valve means arranged in a path of flow of the supercharging air for enabling a power control of the engine, and a bypass air line means connected to the charging air line means and terminating in an air inlet line at a position upstream of the turbocharger means, and a throttle means arranged in an inlet cross section of the bypass air line means, characterized in that the throttle means is constructed as a further throttle valve means, and in that means are provided for mechanically connecting the throttle valve means and



further throttle valve means such that the throttle valve means opens as the further throttle valve means closes and vice versa, with the further throttle valve means of the bypass air line means closing somewhat earlier before the other throttle valve means is entirely open.

4,373,338

SYSTEM FOR GENERATING ENERGY USING THE TEMPERATURE DIFFERENCE BETWEEN THE WATER TEMPERATURE AT THE SEA SURFACE AND THE WATER TEMPERATURE AT GREATER DEPTH

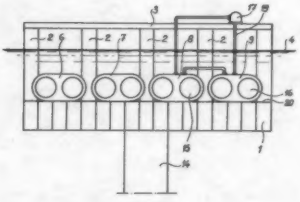
Barend J. G. van der Pot, Delft, Netherlands, assignor to Hollandsche Beton Groep N.V., Rijswijk, Netherlands

Filed Jan. 2, 1981, Ser. No. 222,226

Claims priority, application Netherlands, Jan. 11, 1980, 8000183

Int. Cl.³ F03G 7/04

U.S. Cl. 60—641.7 **3 Claims**



1. In a floating device for generating energy by using a temperature difference between the water temperature at the sea surface and the water temperature at a great depth therefrom, said device including a pontoon; a plurality of columns mounted on said pontoon, said columns intersecting the water surface in the operative position of the device with said pontoon below water level; an upper structure mounted on said columns; a downwardly extending cold water duct suspended from said pontoon; a plurality of energy converting units attached to said columns below water level, each of said energy converting units comprising at least one traversing channel with a pump and heat exchanger, and said energy converting units being in connection with said downwardly extending cold water duct and in connection with warm water of the environment therearound; and means for converting thermal energy resulting from said temperature difference into another form of energy, the improvement comprising said pontoon being box shaped and having a closed central cold water chamber defined by an upper wall, a lower wall and inner walls, said lower wall being joined to said cold water duct; and wherein said energy converting units are mounted upon a flat upper

side of said pontoon, said energy converting units having outlet openings at a side of one side wall of said pontoon with a cold water channel inlet being formed at a lower side of said side wall joining an opening in said upper wall of said cold water chamber and having a warm water channel inlet in said upper side.

4,373,339

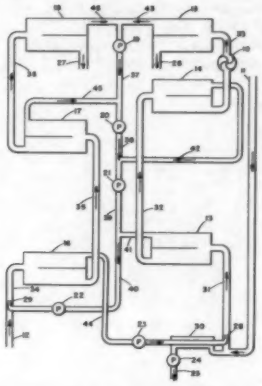
THERMAL ENERGY CONVERSION SYSTEM AND METHOD UTILIZING UNENCASED EXPANDITES

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Trade Finance International, Georgetown, Cayman Islands

Continuation-in-part of Ser. No. 25,800, Apr. 2, 1979, Pat. No. 4,214,449. This application Dec. 14, 1979, Ser. No. 103,573

Int. Cl.³ F01K *25/06*

U.S. Cl. 60—649 76 Claims



1. A method of thermal energy conversion comprising the steps of:

(a) providing a mass of unencased fluid expandites in a mass transport conduit circuit at a first combination of temperature and pressure;

(b) introducing a non-gaseous thermal fluid into the mass transport conduit circuit from a source external to the mass transport conduit circuit at a second combination of temperature and pressure;

(c) combining the provided expandite mass with the introduced thermal fluid in a given conduit of the circuit to create an expandite-fluid mixture having a density at some place in the given conduit that is changed from the average proportional density of the expandite mass and the thermal fluid at their respective prevailing combinations of temperature and pressure prior to such combination with each other to create a pressure differential that enhances the flow of the fluid contained within the circuit;

(d) directing at least a portion of said fluids contained within the circuit to flow vertically through a given portion of the conduit circuit to create a pressure differential in the given portion of the circuit in relation to the remainder of the conduit circuit to thereby enhance the flow of said fluids contained within the conduit circuit; and

(e) converting the pressure of at least a part of said enhanced flow of said contained fluids through the conduit circuit into a useful form of energy;

wherein step (a) comprises the steps of:

(f) separating from the expandite-fluid mixture, an expandite base which comprises at least a portion of said expandite mass; and

(f') thermally conditioning said expandite base.

4,373,340

PEAK LOAD DEVICE OF A MULTISTAGE TURBINE

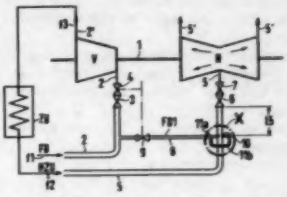
Herbert Keller, Krähenbüschken 4, 4330 Mülheim, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,343

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930184

Int. Cl.³ F01K *13/00*

U.S. Cl. 60—677 11 Claims



1. Peak load device of a multistage turbine, having a high pressure turbine section with an inlet pipe supplying working medium and an exhaust steam outlet, a subsequent turbine section having an inlet pipe connected to the exhaust steam outlet of the high pressure turbine section for receiving the exhaust steam thereof, a bypass line connected from the high pressure turbine section inlet pipe to the subsequent turbine section inlet pipe through which part of the working medium bypasses the high pressure turbine section as a bypass flow, comprising jet compressor inlet means disposed at the connection of the bypass line to the subsequent turbine section inlet pipe for receiving the bypass flow as a motive medium while increasing the pressure of the flow through the subsequent turbine section inlet pipe.

4,373,341

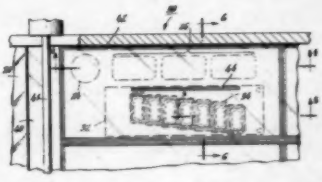
EXPANDIBLE PACKAGE FOR DISPENSING CONTAINERS

Reid A. Mahaffy, Montclair, and George W. Anderson, Little Falls, both of N.J., assignors to Mahaffy & Harder Engineering Co., Fairfield, N.J.

Filed Dec. 18, 1980, Ser. No. 217,702

Int. Cl.³ B65D *5/42*

U.S. Cl. 60—721 16 Claims



1. In a package to be inserted in a container to develop pressure for dispensing the container contents, said package being of the type comprising a sealed enclosure formed by flexible sheet material and containing therewithin a set of chemicals to be reacted together to form an initial gas pressure, said sealed enclosure further containing a plurality of individually sealed cells containing additional reactant chemicals and arranged to be ruptured sequentially as the package expands during a dispensing operation to effect reaction between said additional chemicals and one or more of said set of chemicals to produce additional increments of gas pressure within the sealed enclosure;

that improvement in such a package wherein;

said sealed enclosure comprises a first outer sheet member

formed with a plurality of pockets opening into the interior of the enclosure;

at least one of said pockets containing a first chemical component of said set of chemicals;

at least another of said pockets containing a second chemical component of said set of chemicals and capable of reacting with said first chemical component to develop an initial dispensing gas pressure;

said plurality of pockets in said first outer sheet member further comprising a set of pockets containing additional chemical material capable of reacting with at least one of said chemical components to develop further dispensing pressure;

said sealed enclosure including a second outer sheet member sealed peripherally to said first outer sheet member to form therewith said sealed enclosure encompassing all of said pockets;

a tape member between said first and second outer sheet members and positioned over the openings of said set of pockets, said tape member being sealed around the peripheries of said openings to prevent said chemical material therein from coming into contact with said chemical components;

said tape member being secured to said second outer sheet member to provide for progressive lift-off of said tape member from said first outer sheet member to open the peripheral seals around said set of pockets in sequence as the two outer sheet members separate during a dispensing operation, thereby permitting reactive contact between said additional chemical material and at least one of said chemical components to develop additional increments of gas pressure within said package.

4,373,342

COMBUSTION EQUIPMENT

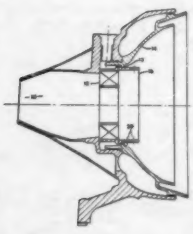
Jeffrey D. Willis, and Nigel P. Gibney, both of Coventry, England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 872,949, Jan. 26, 1978, abandoned. This application Feb. 20, 1980, Ser. No. 123,260

Claims priority, application United Kingdom, Feb. 4, 1977, 4558/77

Int. Cl.³ F23R *3/14*

U.S. Cl. 60—748 **2 Claims**



1. A gas turbine engine combustion chamber comprising:

a flame tube having a dome-shaped head portion provided with a central circular aperture from which said head portion immediately diverges downstream, said tube also having secondary air inlet apertures downstream of said head portion;

a swirler vane assembly mounted in and extending upstream of said central aperture, said assembly having spaced coaxial inner and outer annular sleeves with a ring of swirl vanes extending therebetween, said sleeves forming a single annular passage for the through flow of air into said tube, said inner sleeve being adapted to have a fuel nozzle fitted therein, and the diameter of the downstream edge of said outer sleeve being generally the same as that of said aperture; and

a cylindrical collar of substantially uniform diameter and substantially unobstructed interiorly throughout its length, said diameter being generally the same as that of said aperture, said collar being attached to said head portion and extending coaxially with and from said aperture into said flame tube, whereby in operation carbon accretion on the inner surface of said head portion is reduced substantially, recirculation and mixing of air and fuel is improved in the primary combustion zone upstream of said secondary air inlet apertures and weak flame extinction properties are improved.

4,373,343

HOT WATER PRODUCTION APPARATUS UTILIZING A HEAT PUMP

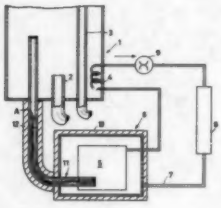
George A. A. Asselman, Eindhoven, Netherlands, and Albertus P. J. Michels, Laveno Mombello, Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1981, Ser. No. 262,258

Claims priority, application Italy, May 12, 1980, 21983 A/80

Int. Cl.³ F25B *27/02*

U.S. Cl. 62—238.6 **4 Claims**



1. Hot water production apparatus comprising a container for water; a heat pump including a motor-compressor unit, a condenser and an evaporator connected in a closed circuit containing a heating fluid, said condenser being associated in heat-exchange relationship with the water in said container, said motor-compressor unit being disposed within a sealed casing in a bath of said heating fluid; and a heat pipe extending between a point within the water container and a point within the sealed casing and insulated over its portion between said water container and said sealed casing, said heat pipe being charged with an inert gas and an operating medium that in the range of 20° to 100° C. has a vapour pressure such that, at a temperature within said range, the front between the inert gas and the operating medium is situated in the portion of the heat pipe present in the water container.

4,373,344

METHODS AND APPARATUS FOR PRODUCING REFRIGERATION

John S. Hinn, Oakland, Calif., assignor to Airco, Inc., Montvale, N.J.

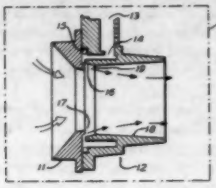
Filed May 18, 1977, Ser. No. 798,203

Int. Cl.³ F25D *25/00*

U.S. Cl. 62—62 **5 Claims**

1. A method for producing refrigeration comprising the steps of providing enclosure means having an internal passage between an inlet and an outlet in communication with ambient atmosphere; passing liquid carbon dioxide through a slot formed in said enclosure means peripherally of said internal passage to form a stream of carbon dioxide solid and gas interiorly of said enclosure means; directing said stream toward the

outlet of said enclosure means; entraining ambient atmosphere through said inlet interiorly of and into said stream; and discharging said stream and entrained atmosphere from said outlet to thereby produce refrigeration.

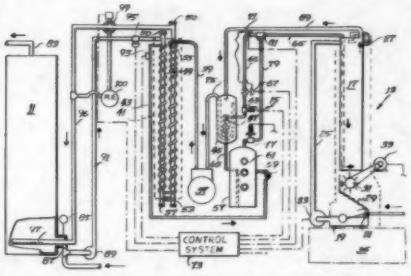


4,373,345

ICE-MAKING AND WATER-HEATING

Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521, and Harry C. Fischer, P.O. Box 1687, Cocoa, Fla. 32922

Filed Apr. 8, 1981, Ser. No. 252,159
Int. Cl.³ F25B 7/00
U.S. Cl. 62—79 **13 Claims**



9. A method of forming ice and heating a liquid such as water, which method comprises

withdrawing liquid refrigerant from a reservoir of refrigerant in liquid and vapor form and expanding said withdrawn refrigerant to vapor to lower its temperature below the freezing point of water and create a cold source,

supplying water and said cold source to ice-maker means and freezing said water to form ice thereupon,

returning said expanded refrigerant vapor to a compressor and discharging hot high-pressure vapor therefrom to a condenser,

supplying liquid to the condenser where it is heated while condensing said high-pressure refrigerant vapor,

returning refrigerant from said condenser to said reservoir through restrictor means which causes a significant pressure drop therein, and

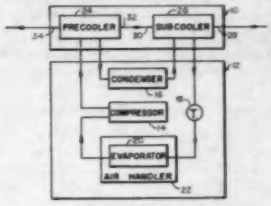
upon completion of ice formation of a desired thickness, halting said supply of said cold source to said ice-maker means, withdrawing relatively warm refrigerant vapor from said reservoir and supplying said withdrawn warm vapor to said ice-maker means to harvest said ice formed thereon whereby said returning of said high-pressure refrigerant to said reservoir through restrictor means assures that the transfer of heat to the liquid being heated in said condenser remains substantially constant throughout said harvest.

4,373,346

PRECOOL/SUBCOOL SYSTEM AND CONDENSER THEREFOR

Thomas H. Hebert, 4815 Sevena Dr., and Theodore M. Hebert, 10225 Hyaleah Rd., both of Tampa, Fla. 33617

Filed Mar. 25, 1981, Ser. No. 247,247
Int. Cl.³ F25B 7/00
U.S. Cl. 62—79 **23 Claims**



9. A method for increasing the efficiency and cooling capacity of a heat pump including an evaporator, a compressor, and a condenser operating in a cooling mode, comprising the steps of:

subcooling the refrigerant flowing from the condenser;

precooling the refrigerant prior to the refrigerant flowing through the condenser;

the step of precooling the refrigerant including the step of flowing a first fluid, having a temperature less than the temperature of the refrigerant, in a heat exchanging relationship with the refrigerant whereby the temperature of the refrigerant is decreased;

the step of subcooling the refrigerant including the step of flowing of a second fluid, having a temperature less than the temperature of the refrigerant, in a heat exchanging relationship with the refrigerant whereby the temperature of the refrigerant is decreased; and

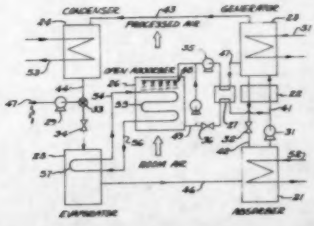
regulating the flow rate of the fluid to subcool the refrigerant flowing from the condenser to a subcooled-liquid state and to precool the refrigerant flowing into the condenser to at least a saturated-vapor state.

4,373,347

HYBRID DOUBLE-ABSORPTION COOLING SYSTEM

John R. Howell, Austin, and C. S. Patrick Peng, Houston, both of Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Apr. 2, 1981, Ser. No. 250,319
Int. Cl.³ F25B 15/00
U.S. Cl. 62—112 **25 Claims**



1. A hybrid double-absorption air cooling system utilizing low grade thermal energy comprising:

an open absorber employing a liquid desiccant solution for absorbing water vapor from air passing therethrough;

a cooling coil associated with said open absorber for cooling air passing through said open absorber; and

a vapor-absorption refrigeration system which uses the water vapor content of said liquid desiccant solution as an evaporable refrigerant and having means for cooling and circulating a first working fluid through said cooling coil and means for circulating said desiccant solution through said open absorber, said refrigeration system including:

a condenser for condensation of the heated water vapor evaporated from said desiccant solution to form condensed liquid water,

an evaporator in fluid communication with said condenser for evaporating said condensed water and for cooling said first working fluid,

an absorber connected to said evaporator for absorbing into the desiccant solution the vaporized water from said evaporator; and

a generator for receiving the absorbed solution from the absorber and generating the heated vapor of said desiccant solution for circulation to said condenser, said generator being in fluid communication with the open absorber for circulating a portion of said liquid desiccant through said open absorber.

11. A method of cooling a process air stream by utilizing low grade thermal energy comprising the steps of:

(a) contacting a liquid desiccant with water to form a desiccant solution;

(b) concentrating the desiccant solution by placing it in heat exchange relation at subatmospheric pressure with a low grade energy source so as to vaporize at least a portion of the water from the desiccant solution;

(c) collecting and condensing the vaporized water;

(d) revaporizing the condensed water while placing it in heat exchange relationship with a first working fluid;

(e) diluting at least a portion of the concentrated desiccant solution by bringing it in contact with the process air stream so as to remove water from the process air stream;

(f) placing the process air stream in heat exchange relation with the first working fluid; and

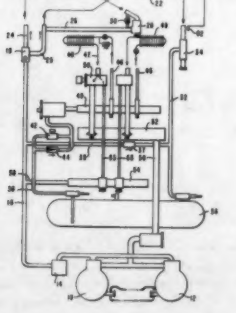
(g) contacting the desiccant solution with the revaporized water.

4,373,348

ENERGY SAVING REFRIGERATION SYSTEM

Fayez Ibrahim, and Edward Bowman, both of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Division of Ser. No. 57,350, Jul. 13, 1979, Pat. No. 4,286,437.
This application Jan. 21, 1981, Ser. No. 226,843
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—115 **11 Claims**



1. A method of operating a refrigeration system having compressor means, condenser means, receiver means and evaporator means and including the steps of:

compressing gaseous refrigerant to a relatively high compressor discharge temperature and relatively high compressor discharge pressure, the compressor discharge temperature being substantially above saturation temperature of the refrigerant at the compressor discharge pressure;

condensing the compressed gaseous refrigerant to a liquid, subcooling the liquid refrigerant to a preselected temperature level before such refrigerant leaves the condenser;

maintaining an operative system pressure within the receiver by the supply of gaseous refrigerant from the compressor;

evaporating the liquid refrigerant at a substantially lower pressure than the compressor discharge pressure; and

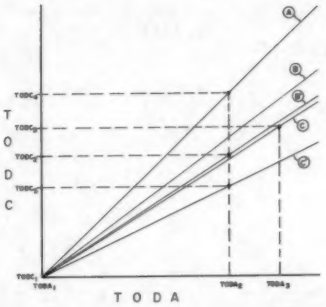
returning the evaporated refrigerant to the compressor.

4,373,349

HEAT PUMP SYSTEM ADAPTIVE DEFROST CONTROL SYSTEM

Dale A. Mueller, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1981, Ser. No. 278,943
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—156 **8 Claims**



1. An outdoor coil defrost control system (hereinafter "defrost control system") for a reverse cycle refrigeration system (hereinafter "system") for heating and cooling a building wherein said system comprises refrigerant compression means, an indoor coil, an outdoor coil, and refrigerant conduit means connecting said compression means and said coils, said defrost control system comprising:

outdoor air temperature sensing means (hereinafter "TODAS") having an output indicative of outdoor air temperature (hereinafter "TODA");

outdoor coil temperature sensing means (hereinafter "TODCS") having an output indicative of the temperature of said outdoor coil (hereinafter "TODC");

enclosure temperature sensing means (hereinafter "STAT") having an output indicative of a demand for heating or cooling of the enclosure;

means (hereinafter "COM") operatively associated with said compression means and adapted to have an output indicative of the operation of said compression means; and

controller means having operative connections to said TODA, TODC, STAT, and COM so as to receive the outputs thereof, said controller being effective to place said system into an outdoor coil defrost mode of operation when all of the following four events have occurred:

(a) TODC is less than T_{PERMIT}, where T_{PERMIT} is a preselected value,

(b) COM output indicates operation of said compression means,

(c) COM output indicates said compression means has operated for a preselected minimum time, and

(d) TODC is equal to or less than N_1. TODA where N_1 is a preselected initial multiplier;

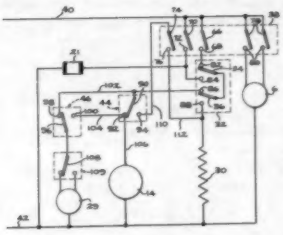
thereafter said controller being effective to place said system into a non-defrost mode of operation when defrost terminate conditions have occurred; and thereafter said controller being effective after each defrost operation to calculate a new value of N_1 based on the stabilized values of TODC and TODA for clear coil conditions whereby the defrost initiate control point is adjusted after each defrost operation.

4,373,350

HEAT PUMP CONTROL/DEFROST CIRCUIT

Joseph R. Noland, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 9, 1981, Ser. No. 282,352
Int. Cl.³ F25D 21/06
U.S. Cl. 62—156 **2 Claims**



1. In a self-contained air conditioning unit for heating and cooling an enclosure, a refrigerant circuit including an outdoor heat exchanger and indoor heat exchanger, a compressor, a reversing valve for selectively connecting said compressor to said heat exchangers whereby said outdoor heat exchanger functions as an evaporator during operation of said unit on the heating cycle and said indoor heat exchanger functions as an evaporator during operation of said unit on the cooling cycle, fan means for moving enclosure air through said indoor heat exchanger, fan means for moving outdoor ambient air through said outdoor heat exchanger, an air conditioner heating cycle control system comprising:

a mode selection switch means for placing said air conditioning unit in said heating or cooling cycle;

a thermostat means having a first stage switching means operable for energizing said compressor in said heating cycle when the temperature of said enclosure is a predetermined comfort level, and a second stage switching means operable for de-energizing said compressor when the temperature of said enclosure drops to a second lower predetermined level during the operation of said compressor in said heating cycle;

a heating means arranged in the path of air through said indoor heat exchanger being energized by said second stage switching means when the temperature of said enclosure drops to the second lower preselected temperature;

a frost control means including a sensing element being exposed to the surface temperature of said outdoor heat exchanger, switch means under control of said sensing element movable between a first position for maintaining operation of said compressor in the heating cycle when said heat exchanger surface temperature sensed by said portions are above a preselected frost accumulation level and being movable to a second position for de-energizing said compressor when either of said sensing elements sense a preselected frost accumulation level to place said unit in a defrost mode and including circuit means operable when said frost control switch means is in the second position for energizing said heating means through said mode selection switch and said thermostat first stage switching means thereby energizing said heater at the start of said defrost mode to provide uninterrupted heating when said compressor is de-energized by said frost control means; and

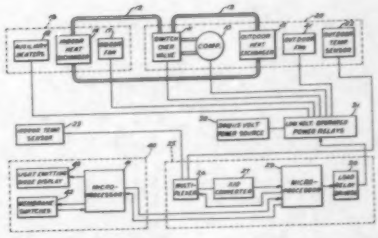
a second control including a sensing element having one portion being exposed to said ambient outdoor temperature means under control of said sensing element for maintaining operation of said outdoor fan independent of said first control when the ambient sensed by said sensing element is above a frost accumulation temperature and to complete a circuit to said fan through said first control if said sensing element of said second control senses a preselected frosting temperature to de-energize said outdoor fan when said compressor is de-energized.

4,373,351

CONTROL APPARATUS FOR AN AIR CONDITIONING SYSTEM PROVIDING A PLURALITY OF ENERGY-SAVING MODES OF OPERATION

Custis L. Stamp, Jr., Tyler, Tex.; Rollie R. Herzog, Louisville, and Michael A. Brennan, Prospect, both of Ky., assignors to Trane CAC, Inc., La Crosse, Wis.

Filed Oct. 14, 1980, Ser. No. 196,414
Int. Cl.³ F25B 13/00; F23N 5/20
U.S. Cl. 62—160 **8 Claims**



1. In an air conditioning system, control apparatus for automatically selecting and implementing, as a system set point operating temperature, a plurality of user-established temperature settings desired to be effective at different times of the day, said control apparatus comprising:

(a) clock means for supplying a signal representative of actual time of day;

(b) user-operated data input and storage means for establishing a plurality of desired time and temperature settings at which the system is to operate including,

(i) first means for establishing a primary temperature setting to be effective during a desired normal operating mode of the system,

(ii) second means for establishing at least two different energy saving time periods during which the system is to operate in energy saving operating modes,

(iii) third means for establishing a plurality of secondary temperature settings capable of being respectively different from each other to be effective during each of said energy saving time periods;

(c) mode control signal generation means responsive to said clock means and to said data input and storage means for establishing control signals representative of any energy saving time period extant at the time of day involved;

(d) temperature control signal generation means responsive to the data input and storage means and to the mode control signal generation means for establishing a system set point temperature control signal representative of said primary temperature setting when the time of day is outside said energy saving time periods and of one of said secondary temperature settings when the time of day is

within an energy saving time period corresponding thereto;

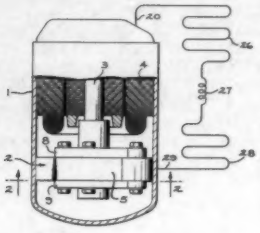
(e) and system functional operating control means responsive to the data input and storage means and to the temperature control signal generating means for operating the system to the system set point temperature indicated by said temperature control signal.

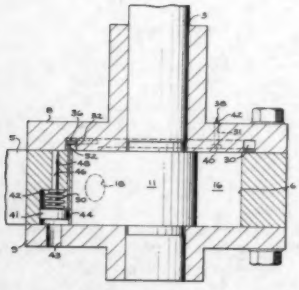
4,373,352

VARIABLE DISPLACEMENT COMPRESSOR

William T. Ladusaw, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 27, 1981, Ser. No. 258,188
Int. Cl.³ F25B *41/00*; F04B *49/02*
U.S. Cl. 62—196 C **11 Claims**





1. A hermetic rotary refrigerant compressor for use in a refrigeration system including refrigerant condensing means for condensing high pressure gaseous refrigerant from said compressor, an expansion device, and evaporator means wherein liquid refrigerant vaporizes and absorbs heat of evaporization comprising:

a hermetic casing adapted to contain a high pressure refrigerant gas;

a rotary compressor positioned in said casing and comprising means including a cylindrical wall member and upper and lower end plates forming the axial walls of an annular compression cylinder, spaced suction and discharge ports communicating with said cylinder;

means connecting said suction port to the evaporator;

means connecting said discharge port through a discharge valve to said casing;

a rotor extending axially between said plates being eccentrically rotatable within said cylinder with the peripheral surface of said rotor arranged to move progressively into sealing relation with successive portions of said cylindrical wall of said annular cylinder to divide said cylinder between a suction side and a compression side;

a motor having a shaft thereon for driving said rotor within said cylinder;

a radially disposed vane slidably maintained in a slot in said wall member between said ports being biased against said rotor to divide said cylinder into low and high pressure sides within said cylinder;

pressure relief means including channel means formed in one of said end plates, said channel being arranged and dimensioned so that a portion thereof is exposed to said cylinder to form a passageway on said low pressure side of said cylinder;

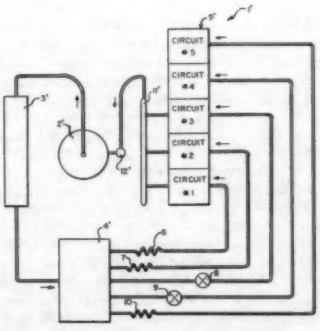
valve means including a valve in said channel and valve actuating means responsive to discharged refrigerant pressure in said casing being operable for moving said valve from a sealing position flush with the axial wall of said cylinder to an open position in said channel by a force varying with the difference in pressure between the suction and discharge pressures for allowing a portion of said refrigerant being compressed in said cylinder by said rotor to flow through said passageway from the compression side of the peripheral surface of said rotor to the suction side of the peripheral surface of said rotor when the pressure of refrigerant in said casing is greater than a predetermined pressure so that refrigerant pressure at said discharge port is maintained within said predetermined pressure.

4,373,353

REFRIGERANT CONTROL

Carmen J. Anzalone, Old Bridge, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed Aug. 17, 1977, Ser. No. 825,218
Int. Cl.³ F25B *5/00, 41/04*
U.S. Cl. 62—200 **6 Claims**



1. A refrigerant control system in combination with an air conditioner having a compressor with a high pressure output and a suction input, a condensor, and an evaporator, the control system being operable to reduce the capacity of the evaporator in response to a heavy load on the system, thereby to reduce the load on the compressor, the improvement comprising:

(a) said evaporator including:

a first evaporator coil circuit, and

a second evaporator coil circuit, said first circuit and said second circuit being independent of each other; and

(b) said control system including:

a distributor receiving liquid refrigerant from said condensor,

a first feed conduit having only one fluid control first means associated therewith which first control means consists of a first expansion device for the liquid refrigerant, operably connecting said first circuit to said distributor, said first expansion device being operable to impart to said first conduit a direct pressure-fluid flow characteristic whereby an increase in the pressure dif-

ferential across said first conduit will normally result in an increase in fluid flow through said first conduit,

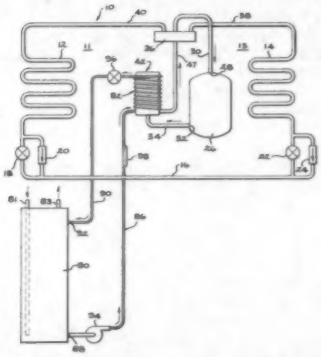
a second feed conduit operably connecting said second circuit to said distributor and having only one fluid flow control second means associated therewith which second control means consists of a second expansion device for the liquid refrigerant, said second expansion device being operable to impart to said second conduit an inverse pressure-fluid flow characteristic which, over a predetermined operating range, will result in a decrease in or substantially complete throttling of, any fluid flow through said second circuit with an increase in the pressure differential across said second conduit, thereby to make the system responsive to a heavy load by reducing the capacity of the evaporator, while sustaining a flow of liquid refrigerant through said first circuit.

4,373,354

COMBINATION DISCHARGE GAS MUFFLER AND WATER HEATER

George N. Sawyer, 14 Bayview, Rte. 2, Flint, Tex. 75762, assignor to Trane CAC, Inc., La Crosse, Wis.

Filed Sep. 28, 1981, Ser. No. 306,024
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **13 Claims**



1. A muffler for a refrigeration system having heat exchange means being adapted to be connected to a water source, said refrigeration system including a compressor, a condenser for condensing hot gaseous refrigerant discharged from said compressor, an evaporator for evaporating said condensed refrigerant, said muffler comprising:

a cylindrical housing, a cap portion closing each end of said housing;

an inlet on said housing connected to the refrigerant system for receiving said hot gaseous refrigerant and an outlet arranging said housing in series flow in said refrigeration system;

a tubular casing arranged in said housing having its longitudinal wall spaced from the interior wall of said housing;

a cap on one end of said casing including an inlet, means connecting said inlet to said housing inlet for directing said hot gaseous refrigerant into said casing;

a cap on the other end of said casing including a plurality of outlet apertures for delivering said hot gaseous refrigerant to the interior of said housing;

a helical wall extending between the casing outer wall and housing interior wall to form a passage for said hot gaseous refrigerant between the outlet aperture of said casing and said housing inlet to return said hot gaseous refrigerant to said refrigerant system; and

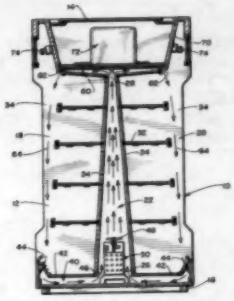
a water passageway connected to said water source being arranged in heat exchange relationship with the outer surface of said housing being heated by said hot gaseous refrigerant to increase the temperature of said water as it flows through said water tube.

4,373,355

DUAL REFRIGERATED DISPLAY CABINET

John E. Monroe, Los Angeles, Calif., assignor to Displaymor Manufacturing Company, Inc., Los Angeles, Calif.

Filed Apr. 20, 1981, Ser. No. 255,561
Int. Cl.³ A47F *3/04*
U.S. Cl. 62—256 **4 Claims**



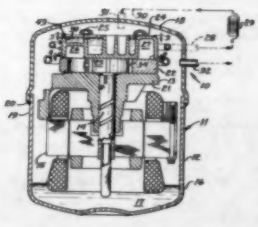
1. In a display case, the combination of: a housing having sidewalls and top and bottom walls for maintaining said sidewalls in spaced relationship with each other, said housing having open sides providing communication with first and second display areas at opposite sides of said housing; a common plenum chamber defined by said sidewalls and inclined walls located centrally of said housing and extending between said sidewalls; a lower passageway in communication with the lower extremity of said plenum chamber; an upper passageway in communication with the upper extremity of said plenum chamber is discharge refrigerated air downwardly across said display areas at the opposite sides of said display case; a refrigerated coil located in the flow path to said plenum chamber to refrigerate the air flowing into said plenum chamber; and a compressor located in said housing in communication with said refrigerated coil to introduce refrigerant into said refrigerated coil and cause chilling of the air passing through said coil into said plenum chamber.

4,373,356

LUBRICATION SYSTEM FOR ROTARY COMPRESSOR

Ralph F. Connor, Knight Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 27, 1981, Ser. No. 287,412
Int. Cl.³ F25B *43/02*
U.S. Cl. 62—468 **20 Claims**



1. In a refrigerant compressor system including a housing, a rotary compressor apparatus within said housing and defining

a head, first discharge means for discharging compressed refrigerant/oil mixture from the compressor apparatus, and precooling means including a heat exchanger having an inlet connected to said first discharge means and an outlet connected to said housing to supply refrigerant/oil mixture thereinto for discharge of refrigerant vapor therefrom outwardly through a second discharge means, the improvement comprising:

means for directing the precooled refrigerant/oil mixture from said precooling means outlet into direct heat transfer association with said compressor head to cause evaporation of the refrigerant from said mixture.

4,373,357
CRYOGENIC COOLING APPARATUS

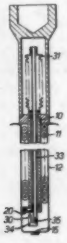
Norman H. Adams, Redditch, and David N. Campbell, King's Coughton, both of England, assignors to The Hymatic Engineering Company Limited, England

Filed Oct. 8, 1981, Ser. No. 309,830

Claims priority, application United Kingdom, Oct. 10, 1980, 8032822

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—514 JT **8 Claims**



1. In a cryogenic cooling apparatus of the type including a substantially tubular heat exchanger, a Joule-Thompson nozzle and a container, said heat exchanger including a first path communicating with said nozzle through which, in use, refrigerant gas from a supply under pressure is supplied to said nozzle to liquify a portion of said gas in said container whereafter the low pressure gas is exhausted through a second path, said apparatus further including a valve member co-operating with said nozzle to vary its effective area to automatically vary the flow of said refrigerant gas and an operating member operatively connected to said valve member and to a movable wall, said movable wall being exposed on one side, in use, to the pressure of a sensing vapour which in operation is in equilibrium with liquid refrigerant;

the improvement comprising providing said operating member in the form of a combination operating member and sensing tube, said tube having a hollow interior, said interior communicating with the space containing said sensing vapour and extending down to the region of said nozzle whereby, in use, the heat extracted from the sensing vapour in said interior of said operating member is a function of the quantity of liquid refrigerant in contact with said operating member.

4,373,358
TORQUE LIMITING MECHANISM

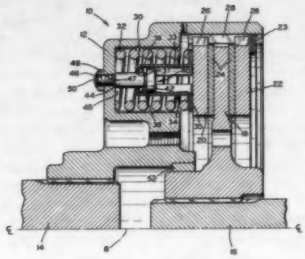
Dean A. Pearch, Mt. Pleasant, and Thomas F. Pung, Sr., Weidman, both of Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 29, 1980, Ser. No. 220,874

Int. Cl.³ F16D *7/02, 11/00*

U.S. Cl. 464—48 **14 Claims**

1. In a torque limiter of the type including a housing, at least one driven friction disc, one driver friction disc, and axially moveable biasing means for urging said discs together, an improvement comprising means for automatically arresting said biasing means at a predetermined limit of axial movement



of said means, said biasing means comprising at least one spring positioned interjacent said housing and said friction discs.

4,373,359
HYDROSTATIC-MECHANICAL GEAR UNIT

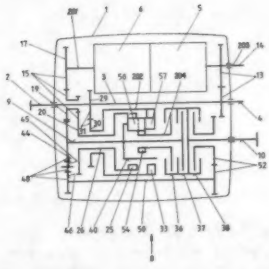
Friedrich Ehrlinger, Friedrichshafen, and Michael Meyerle, Meckenbeuren, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen A.G., Friedrichshafen, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,863

Claims priority, application Fed. Rep. of Germany, May 8, 1979, 2918448

Int. Cl.³ F16H *47/10, 37/08*

U.S. Cl. 74—687 **20 Claims**



1. A hydrostatic-mechanical gear unit comprising an input shaft for receiving power from an engine, means for dividing power in the shaft into a hydraulic power branch and a mechanical power branch, the hydraulic power branch including a first hydrostatic unit operatively connected with a second hydrostatic unit, the input shaft being adapted to drive the first hydrostatic unit, and an output hydrostatic shaft adapted to be driven from the second hydrostatic unit, a planetary wheel set, gearing means for engaging the output hydrostatic shaft to transmit rotational power to said planetary wheel set, the mechanical power branch including gearing operatively engaging the input shaft and engaging the planetary wheel set, and adapted to impart rotational power to the planetary wheel set, the planetary wheel set being adapted to integrate the hydraulically activated rotation and the mechanically activated rotation, and intermediate shaft selectively driven by a first output means from the planetary wheel set, and coupling means for engaging the intermediate shaft and an output shaft and to thereby transmit rotational power to the output shaft when the gear unit is in a first driving stage, a coaxial shaft about the intermediate shaft and adapted to be selectively driven by a second output means from the planetary wheel set

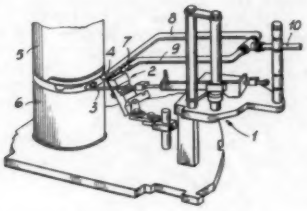
when the gear unit is in a second driving stage, the coupling means disengaging the intermediate shaft from the output shaft and engaging the coaxial shaft with the output shaft to transmit power to the output shaft, the planetary wheel set and the coupling means being mounted on the same shaft, whereby at the transition between the first driving stage and second driving stage, the first and second output means of the planetary wheel set are at substantially the same rate of rotation.

4,373,360

DEVICE FOR CORRECTLY POSITIONING YARNS PRIOR TO KNITTING IN A CIRCULAR KNITTING MACHINE

Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati S.p.A., Brescia, Italy

Filed Sep. 22, 1980, Ser. No. 189,240
Claims priority, application Italy, Oct. 1, 1979, 26156 A/79
Int. Cl.³ D04B *15/48, 15/60*
U.S. Cl. 66—131 **11 Claims**



1. A device for correctly positioning yarns prior to knitting in a circular knitting machine, in particular a hose knitting machine, of the type comprising at least one needle cylinder, at least one striper unit having a plurality of yarn feeding fingers, a yarn cutting and gripping device and means for actuating said yarn feeding fingers and yarn cutting and gripping device according to a machine knitting program, the device comprising blowing nozzles respectively oriented towards said at least one needle cylinder and said yarn cutting and gripping device, at least one movably supported valve for admitting pressure fluid from a pressure fluid supply conduit to said nozzles, and control means for controlling said at least one valve, wherein said control means comprise at least one continuously rotatable control cam and means associated with said at least one valve for moving said at least one valve between a rest position and a position for operation in which said at least one control cam operates thereon to cause said at least one valve to provide communication between said supply conduit and said nozzles simultaneously with the actuation of any one of said yarn feeding fingers of said at least one striper unit.

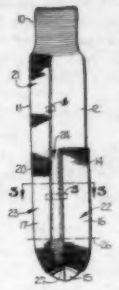
4,373,361

SKI SOCK WITH INTEGRALLY KNIT THICKENED FABRIC AREAS

James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677

Filed Apr. 13, 1981, Ser. No. 253,708
Int. Cl.³ A41B *11/00*; D04B *9/46*
U.S. Cl. 66—178 R **30 Claims**

1. A sock particularly adapted for wear with ski boots and the like and being adapted to cushion and protect the front portion of the leg from discomfort caused by the ski boot, said sock being knit throughout of at least one body yarn and including an integrally knit leg and foot, said leg and foot comprising a front half covering the front of the leg and the top of the foot of the wearer, and a rear half covering the rear of the leg, the heel, and the sole of the foot of the wearer, additional yarn knit in plated relationship with said body yarn in the front half of said leg and providing a thickened fabric area extending along the front of the leg of the wearer, areas adjacent opposite sides of said thickened fabric area in the front half of said leg being knit of said body yarn only, said thickened fabric area in said front half of said leg cushioning and protecting the front of the leg of the wearer, and said body yarn areas adjacent opposite sides of said thickened fabric area providing substantially



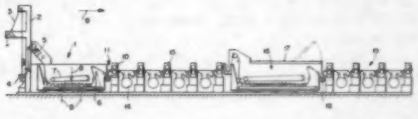
greater stretchability than the stretchability of said thickened fabric area so that the sock may be easily drawn on and removed from the foot and leg of the wearer and the sock will readily conform to the configuration of the leg of the wearer.

4,373,362

APPARATUS FOR THE CONTINUOUS WASHING OF LENGTHS OF TEXTILE MATERIAL

Hans Fleissaer, Riehen, Switzerland, assignor to Vepa AG, Basel, Switzerland

Division of Ser. No. 17,277, Mar. 5, 1979, Pat. No. 4,247,294. This application Oct. 21, 1980, Ser. No. 199,307
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809433; Mar. 9, 1978, 2810162
Int. Cl.³ D06B *3/10*
U.S. Cl. 68—9 **23 Claims**



1. An apparatus for continuous washing of printed and dyefixed, web-shaped textile material including woven or knit fabrics of natural and/or synthetic fibers which comprises feed means for depositing the textile material in folds into a dwell bath; conveying means arranged underneath the liquid level in said dwell bath for transporting the textile material in a folded condition from an inlet end through said bath to an outlet end of said bath, said conveying means including two spaced apart endless belts for continuously conveying the textile material in a folded condition between mutually parallel conveying surfaces provided by said belts, said conveying surfaces being disposed underneath the bath level and rotating in the same direction; means located at the outlet end of the bath above the liquid level for removing liquid and a film of dye material detachable from said textile material and for withdrawing the textile material from said dwell bath; and at least one washing bath unit having sieve drum means located within a washing bath for washing the textile material, said sieve drum means being subjected to forced throughflow of the washing liquid from the outside to the inside of the drum means; said means for depositing said textile material in folds including a slide means at the inlet end of the dwell bath for guiding said folds of textile material into a space between said two endless belts and said slide means being movable in a reciprocating fashion whereby the textile material is subjected to longitudinal com-

pacting and relief during transportation through said dwell bath between said two belts.

4,373,363

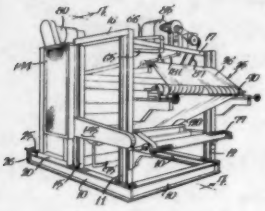
SKIN WASHER

Robert E. Edwards, Inverness; Donald H. McKee, Waukegan, and Claude D. Brown, Hanover Park, all of Ill., assignors to The Roy M. Moffitt Company, Schiller Park, Ill.

Filed Sep. 22, 1980, Ser. No. 189,056

Int. Cl.³ C14C *1/00*

U.S. Cl. 69—28 **18 Claims**



1. A skin washer comprising, a conveyor belt for conveying a skin to a washing station, a series of spaced-apart back-up members engaging one side of the conveyor belt at said washing station and defining a plane of support for the conveyor belt, and a pair of driven brush rollers at the opposite side of the conveyor belt and positioned opposite the spaces between the back-up members and across said plane of support to concavely deflect the conveyor belt and increase the arc of contact of said brush rollers with a skin supported on said opposite side of the conveyor belt.

4,373,364

METHOD OF CONTROLLING THE TEMPERATURE OF A HEATING FURNACE

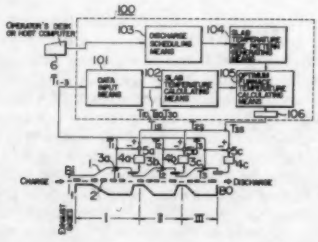
Sunao Tanimoto, Tokyo; Shinya Tanifuji, and Yasuo Morooka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,169

Claims priority, application Japan, Nov. 26, 1979, 54-152102

Int. Cl.³ F27B *9/40*

U.S. Cl. 72—8 **10 Claims**



1. A temperature controlling method for heating, with a heating furnace having at least one heating zone provided with a controllable heating means, materials charged into said furnace such that said materials are heated up to an aimed temperature when they leave said furnace, said method comprising the steps of:

performing predictive calculation of a staying period of said material in the heating furnace when instructions for changing the operation condition of said heating furnace are detected;

calculating optimum slab temperature rise patterns for respective slabs with at least different staying periods in the heating furnace, along which patterns said materials are heated during the staying periods as obtained in said predictive calculation to attain aimed discharge temperatures and with which patterns a fuel consumption rate required for said heating becomes minimum by determining a minimum fuel flow rate for each zone as a function of furnace zone temperatures and furnace exhaust gas temperature;

computing zone temperatures which minimize deviations of slab temperatures in the respective zones after predetermined periods of time with respect to the optimum slab temperature rise patterns; and

controlling furnace temperatures with the computed zone temperatures as settings for the respective zones.

4,373,365

UP-SET SHRINKER FOR PRODUCING THICK WALL STEEL PIPE

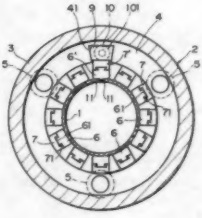
Tadaaki Taira; Toshio Ishihara, and Junichiro Takehara, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1980, Ser. No. 151,470

Claims priority, application Japan, May 22, 1979, 54-62245

Int. Cl.³ B21D *5/10*

U.S. Cl. 72—52 **7 Claims**



1. In an apparatus for producing thick wall steel pipe of generally O-shape, and having butting edges, and inner and outer surfaces, comprising:

an up-set shrinker having an outer cylinder (3) fixed to a base; an inner cylinder (4) disposed on an inner side of said outer cylinder (3); at least one reducing cylinder (5) coupled at least to said inner cylinder (4), said inner cylinder (4) being slidable axially of said outer cylinder (3) by means of said at least one reducing cylinder (5); said inner cylinder (4) having a guide groove (41) on one part of the inner surface thereof along its axial direction; a sliding block (9) mounted in said guide groove (41); an edge processing shrinker die (6') mounted to and held by said sliding block (9); and an edge processing cylinder (10) coupled to said sliding block (9), said sliding block (9) being slidable within said guide groove (41) by means of said edge processing cylinder (10);

the improvement wherein:

said inner cylinder (4) includes a plurality of taper segments (7) projecting from the inner surface of said inner cylinder centripetally thereof;

a plurality of reducing shrinker dies (6) for shaping parts of the O-shaped pipe other than edge butting portions of the O-shaped pipe, each reducing shrinker die (6) being slidably held by a respective one of said taper segments (7) via a mating dovetail (61) and a dovetail groove (71) and being non-rotatable;

a stopper member (161) is provided for restraining respective ends of said reducing shrinker dies (6);

said slidable block (9) includes a further taper segment (7') projecting inwardly centripetally thereof;

said edge processing shrinker die (6') being provided with a forming surface configured to bear against and shape outer surfaces of the edge butting portions of the O-

shaped pipe, without being interposed between the butting edges of the O-shaped pipe, said edge processing shrinker die (6') being slidably mounted to said further taper segment (7') via a mating dovetail (61') and a dovetail groove (71') and being non-rotatable;

a further stopper member (16) for restraining an end of said edge processing shrinker die (6'); and

said forming surface of said edge processing shrinker die (6') having a surface which faces interior of said inner cylinder (4), and a cavity defined over the full length of said surface thereof which faces the interior of said inner cylinder (4), and a projecting area (63) on said cavity (62) and extending over the full length of said edge processing shrinker die (6');

said plurality of reducing shrinker dies (6) being displaceable centripetally of said inner cylinder (4) by sliding of said inner cylinder (4) in said outer cylinder (3) by means of said reducing cylinder (5), and said edge processing shrinker die (6') being displaceable centripetally within said guide groove (41) by sliding of said sliding block (9) by means of said edge processing cylinder (10); and

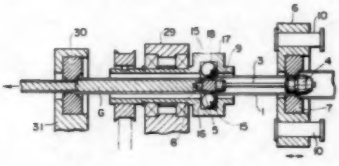
wherein no inner die is provided at least in the vicinity of said reducing shrinker dies (6) so that no contact is made to the inner surface of the generally O-shaped pipe-blank in the vicinity of said reducing shrinker dies, no inner die is provided opposite said edge processing shrinker die (6') so that no contact is made to the inner surface of the generally O-shaped pipe-blank in the vicinity of said edge processing shrinker die.

4,373,366

MACHINE FOR FORMING SPIRAL GROOVES IN METAL PIPE INNER SURFACE

Aritaka Tatsumi, Ibaraki, Japan, assignor to Hitachi Cable, Ltd., Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,152
Claims priority, application Japan, Feb. 19, 1980, 55-19448
Int. Cl.³ B21B *17/08*; B21C *1/24*
U.S. Cl. 72—75 **12 Claims**



1. A machine for grooving an inner surface of a moving metal pipe comprising:

a tie rod insertable into said metal pipe;

a grooving plug rotatably mounted on a front end of said tie rod;

a floating plug fixedly secured to a rear end of said tie rod;

a rotary head;

a first die proposed at a position corresponding to a position of said floating plug, said first die being adapted to hold said grooving plug at a predetermined position in said rotary head;

said rotary head being disposed downstream of said first die;

a plurality of balls planetarily rotatably arranged in said rotary head to press a wall of said metal pipe against said grooving plug in said metal pipe so as to reduce a diameter of said metal pipe; and

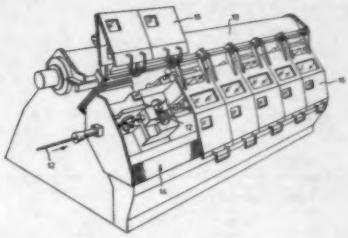
a second die arranged downstream of said rotary head, for finishing said metal pipe thus processed.

4,373,367

ROLLER ENTRY GUIDES FOR ROD MILLS

Mario Fabris, 8 Roberts Rd., Grimsby, Ontario, Canada (L3M 3X2)

Continuation-in-part of Ser. No. 80,820, Oct. 1, 1979, Pat. No. 4,295,356. This application Nov. 17, 1980, Ser. No. 207,317
Int. Cl.³ B21B *39/16*
U.S. Cl. 72—250 **7 Claims**



1. A roller entry guide for a rod mill comprising:

a body providing a rod passage therein through which the rod passes;

a pair of rocker arm members mounted by the body on opposite sides of the rod passage for pivoting rocking movement about respective parallel pivot axes;

a pair of guide roller members each mounted by the respective rocker arm member for rotation about a respective rotation axis, the pivoting rocking movement of the arm members permitting movement of the guide roller members toward and away from one another;

each guide roller member having a ring of fluid reaction members coaxial with its axis of rotation;

means disposed to direct a stream of fluid at the said ring of fluid reaction members to rotate the respective guide roller member about its axis of rotation; said means comprising a U-shaped bracket secured to said body through arms thereof and having the plane containing said arms perpendicular to a plane containing the rocker arms, a bore being provided in at least one of said arms and having an inlet to receive pressurised fluid and an outlet to direct a stream of fluid at said ring of fluid reaction members, and

means for feeding fluid to the said inlet whereby the guide roller members can be rotated at about their operative speeds prior to engagement by a rod passing through the device by impingement of fluid with said fluid reaction members.

4,373,368

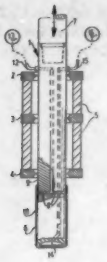
HYDRAULIC ASSIST STRIPPING

Hendrik G. Heijting, Deventer, Netherlands, assignor to Thomassen & Drijver-Verblifa NV, Deventer, Netherlands

Filed Jun. 29, 1981, Ser. No. 278,783
Int. Cl.³ B71D *45/00*
U.S. Cl. 72—344 **9 Claims**

1. A method of forming a cylindrical wall-ironed sleeve having a bottom and a radially inwardly enlarged wall thickness at an end remote from said bottom with there being an internally tapered transition region between a normal wall thickness and the enlarged wall thickness, said method including the forming of the sleeve on a mandrel with said enlarged wall thickness being interlocked with said mandrel; the step of introducing a fluid under pressure through the mandrel be-

tween the mandrel and the sleeve at the transition region of the sleeve to momentarily radially enlarge the end of the sleeve



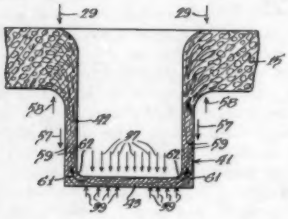
remote from the bottom and release the interlock between the sleeve and the mandrel.

4,373,369

METHOD OF FORMING INTEGRAL FLANGES IN A SHEET

John A. Schey, Waterloo, Canada, assignor to Modine Manufacturing Company, Racine, Wis.

Filed Mar. 27, 1980, Ser. No. 134,513
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—347 **10 Claims**



1. A method of forming an integral depression in a plastically deformable metal sheet comprising:

retaining said sheet against substantial movement around the area of the intended depression;

and exerting localized pressure on one side of said sheet over the area of said depression while simultaneously resisting said deformation by applying a yielding counterpressure on the opposite side of said sheet over the external area of said depression maintaining the sheet material in material flowing compression during the formation of said depression and thereby bringing the sheet material into a state of plastic flow in the area of said depression, said depression thereupon comprising a heavily deformed side wall and integral base of said sheet material.

4,373,370

PRESS TRANSFER BAR

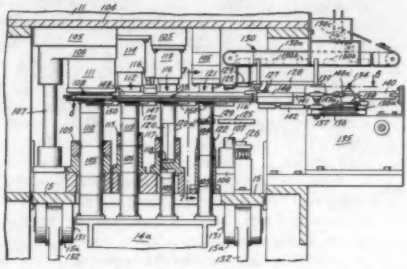
Robert J. Allen, Daly City; Edward W. Blake, Orinda, both of Calif.; Manjeshwar S. Rao, Hoffman Estates, Ill., and Kurt L. Hahn, San Rafael, Calif., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 11, 1979, Ser. No. 56,704
Int. Cl.³ B21D *72/00*
U.S. Cl. 72—349 **9 Claims**

1. A mechanism for periodically moving objects from one place to another including:

(a) a first oscillating means mounted for movement to and fro in a plane and having a first drive mechanism associated therewith for a first controlled periodic input movement to said first oscillating means;

(b) a second oscillating means carried on said first means for reciprocal movements relative thereto in substantially the same plane and direction and having a second drive having relative movement to and associated with said first drive mechanism and cooperatively connected to said second means for establishing a second periodic input movement relative to said first means;



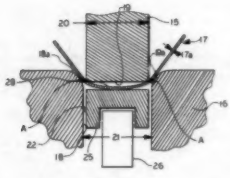
(c) an opposed pair of intermediate means supported to reciprocate with said first periodic input movement of said first means and carried for pivotal movement toward and away from one another each about a fixed pivot axis carried on and normal to said first oscillating means, said intermediate means being interconnected for activation by said second means in timed periodic relation to the reciprocation of said first means.

4,373,371

METHOD OF REDUCING SPRINGBACK IN MECHANICALLY PRESSED SHEET MATERIALS-I

You C. Liu, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 29, 1980, Ser. No. 220,348
Int. Cl.³ B21D *5/01*
U.S. Cl. 72—379 **13 Claims**



1. A method of bending sheet material by use of complimentary male punch and female molding members, said female molding member having a counterpad controllably movable to resist movement of the male punch member in said female molding member; the method comprising:

(a) striking said members together through a first increment with said sheet material therebetween to firstly bend said sheet metal at a first pair of bend loci spaced apart a predetermined distance, said counterpad permitting elastic strain to shape the sheet metal between said first bend loci as a curvilinear section;

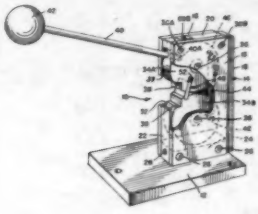
(b) striking said members together through a second increment with said firstly bend sheet metal therebetween, said counterpad being controlled to cooperate with said male punch member to flatten said curvilinear section so that said members bend said sheet metal at a pair of second bend loci spaced differently than said first pair of bend loci.

4,373,372

APPARATUS FOR ASSEMBLING ELECTRICAL CABLES TO ELECTRICAL CONNECTORS

Harley R. Holt, Forest Park, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jul. 14, 1980, Ser. No. 167,945
Int. Cl.³ B21K 25/00
U.S. Cl. 72—406 17 Claims



1. Apparatus for assembling electrical cables, or the like, to an electrical connector which has cable clamp means for clamping a cable in position with its conductors terminated to contact means on the connector, comprising:

a base;

a pair of opposed jaw members rotatably mounted on said base for movement about generally parallel, spaced axes of rotation toward and away from a connector to engage said cable clamp means for clamping a cable to provide strain relief therefor;

actuator means for rotating said jaw members; and

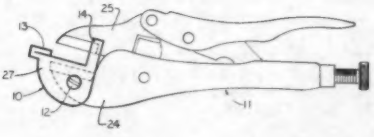
direct drive link means interconnecting said jaw members for conjoint rotation thereof in opposite directions toward and away from said cable clamp means in response to movement of said actuator means, said direct drive link means comprising a slidable plate extending between said jaw members in driving relationship therewith.

4,373,373

AUTOMOBILE BODY REPAIR

William J. Schaefer, 3706 Jay La. South, Rolling Meadows, Ill. 60008

Filed Feb. 28, 1980, Ser. No. 125,332
Int. Cl.³ B21D 37/02
U.S. Cl. 72—413 5 Claims



1. A device for forming an offset shoulder and depressed parallel edge along the outside perimeter of a hole in the sheet metal of an automobile body, said device being adapted for use with a standard compound acting adjustable vise type of hand pliers, having a first upper pan and a second lower jaw, comprising:

jaw lug means constructed as part of said device, said jawing means being positioned on the upper jaw of the said hand pliers,

attaching means securing the said jaw lug means to the said upper jaw of the said hand pliers,

work stop means located to allow the formation of said offset shoulder and edge in said piece of sheet metal, in an evenly contoured shape at a predetermined distance from said edge,

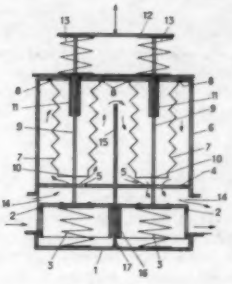
said attachment means including adjustment means wherein the formation of said offset shoulder and edge in said piece of sheet metal can be adjusted to have a longer or shorter offset radius according to the needs of a workman.

4,373,374

ARRANGEMENT FOR MEASURING THE AMOUNT OF GAS ENCLOSED IN A LIQUID

Jean Bajard, Truchtersheim, France, assignor to Societe Alsacienne de Services Industriels, Gambsheim, France

Filed Oct. 23, 1980, Ser. No. 199,913
Claims priority, application France, Oct. 26, 1979, 79 27108
Int. Cl.³ G01N 7/14
U.S. Cl. 73—19 8 Claims



1. An arrangement for automatically measuring the amount of gas in a liquid, and especially the carbonic gas in beverages such as beer, mineral water, sodas, fruit juice, or the like, the arrangement comprising a bypass having an inlet and an outlet and being adapted to be connected into a loop communicating at opposite ends with a main conduit for the liquid; a measuring chamber destined to enclose a sample of the liquid and communicating with said bypass; closure members movable in said bypass between a first position for directing liquid passing through said inlet to flow through said measuring chamber to said outlet while preventing a direct communication between said inlet and said outlet and a second position preventing communication between said bypass and said measuring chamber, so that liquid passing through said inlet will flow directly to said outlet while enclosing a sample of the liquid in said measuring chamber;

a deformable body extending into said measuring chamber for changing the volume of the latter when communication between said measuring chamber and said bypass is prevented for creating in said measuring chamber the necessary condition for measuring the gas content in the liquid; and a single control member operatively connected to said closure members and to said deformable body so that said single control member ensures successively displacement of said movable closure members between said first and second positions and control of said deformable body to modify the volume of the measuring chamber, and vice versa.

4,373,375

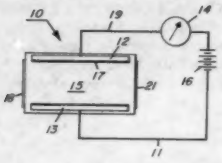
HYDROGEN SENSOR

James H. Terhune; John P. Sturtz, and John P. Neissel, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 19, 1980, Ser. No. 218,495
Int. Cl.³ G01N 23/10, 27/66
U.S. Cl. 73—19 28 Claims

1. A hydrogen sensor comprising: a sealed and evacuated chamber; a first window in said chamber formed of a material selectively permeable to hydrogen to admit hydrogen from an adjacent atmosphere into said chamber; a source of alpha particles in said chamber for ionizing the hydrogen therein; a

second window in said chamber formed of a material selectively permeable to helium, said second window providing an outlet from said chamber for helium formed by combination of alpha particles and electrons in said chamber; and a pair of



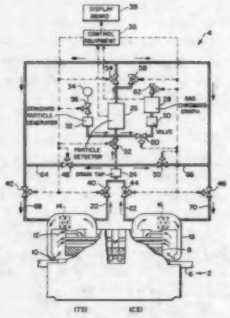
spaced electrodes in said chamber connected to a source of voltage for collecting electrons in said chamber, the resulting electron current being indicative of the concentration of hydrogen in said chamber.

4,373,376

METHOD AND APPARATUS FOR DIAGNOSING OVERHEATING OF AN ELECTRIC MACHINE

Kiyoshi Narato, Ibaraki; Keizo Ohtsuka, and Sadahiko Niwa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,096
Claims priority, application Japan, Sep. 17, 1979, 54/117846
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—23.1 **13 Claims**



1. An overheat diagnosing apparatus for a gas-cooled type electric machine having at least some regions coated with an organic insulating material which decomposes when subjected to high temperatures, the apparatus comprising:

means for selectively extracting a coolant gas from at least one region of an interior space of the electric machine;

means for detecting a density of the decomposed organic insulating material in the selectively extracted coolant gas and for enabling a selection of an overheat region when the density of the decomposed organic insulating material in the coolant gas in the selected region is higher than a predetermined level;

means for analyzing a composition of the decomposed organic insulating material in the coolant gas from a selected overheat region and for enabling a determination of an overheat position in the selected overheat region; and

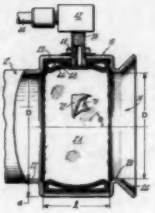
means for controlling said extracting means, said detecting means, and said analyzing means so that the coolant gas in the selected overheat region is introduced into said analyzing means.

4,373,377

UNIVERSAL TAIL PIPE CONNECTOR

Harvey A. Smith, Hampden, Mass., and Joseph T. Fleming, East Granby, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 27, 1980, Ser. No. 200,796
Int. Cl.³ G01N *31/00*; F16L *17/00*
U.S. Cl. 73—23 **5 Claims**



1. Apparatus for connecting exhaust emissions equipment to combustion engine exhaust pipes of varying diameter, in a system having a source of positive pressure signals and a source of vacuum pressure signals, comprising:

a hollow cylindrical housing having longitudinally spaced inlet and outlet ports for connecting to the exhaust pipe and emissions equipment respectively, said inlet port and said housing having internal diameters equal to or greater than the largest diameter exhaust pipe, said housing including an annular collar for providing therein an internal annular groove adjacent said inlet port;

three-way valve means, having first and second input apertures connected to the sources of positive pressure and negative pressure signals respectively, and having an output aperture, said valve means including switch means responsive to operator control for connecting, alternately, each input aperture to said output aperture; and

an inflatable seal, including an inflatable annular bladder of high temperature silicone rubber secured in said internal annular groove in axial registration within said housing by a pneumatic stem assembly adapted to engage said annular collar, said bladder being connected through said stem to said output aperture of said three-way valve for responding, alternately in dependence on operator control, to said positive pressure and vacuum pressure signals, said bladder retracting in response to applied vacuum pressure signals and nestling along a mating surface thereof within said internal annular groove so as to allow unobstructed internal passage of the exhaust pipe within said housing, said bladder inflating in response to applied positive pressure signals to provide a positive pressure seal between a sealing surface thereof and the outer surface contour of the inserted exhaust pipe.

4,373,378

VIBRATION SENSOR FOR AN AUTOMOTIVE VEHICLE

Takeshi Fujishiro, Yokosuka; Kiyoshi Takeuchi, Yokohama, and Toru Kita, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

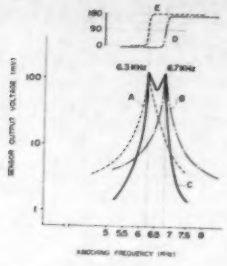
Filed Oct. 30, 1980, Ser. No. 202,271
Claims priority, application Japan, Nov. 6, 1979, 54-143736
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **13 Claims**

1. A vibration sensor which comprises:

(a) a housing having a hollow cavity;

(b) a plurality of piezoelectric vibration elements free to vibrate within the hollow cavity of said housing, the resonant frequencies of said vibration elements being selected to be relatively close to each other, said vibration elements being arranged to generate a piezoelectric sensor signal such that the respective piezoelectric voltages from

said vibration elements are synthesized in the same polarity when engine knocking frequency lies between the two resonant frequencies of said vibration elements and are synthesized in the reverse polarity when engine knocking frequency lies below the lower resonant frequency or lies



above the higher resonant frequency of said vibration elements; and

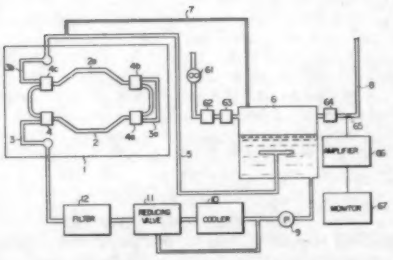
(c) conducting means for conducting the piezoelectric signal in response to the vibration of said piezoelectric elements, whereby a multi-peak vibration response characteristic is obtained.

4,373,379

METHOD AND APPARATUS FOR DETECTING DEFECTS IN A WATER COOLING SYSTEM OF A HYDROGEN-COOLED DYNAMIC ELECTRIC MACHINE

Sanshiro Obara, and Ikuro Miyashita, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,170
Claims priority, application Japan, Nov. 26, 1979, 54/151971
Int. Cl.³ G01M 3/22
U.S. Cl. 73—40.5 R **10 Claims**



1. A method of detecting defects in a water cooling system which is arranged for circularly supplying a cooling water into a hydrogen cooled electrical machine having a water cooling passage therein, said water cooling system including a water supply tank having a top wall with which said water supply tank defines above a pool of the cooling water therein an upper space communicating with the atmosphere through an air pipe, and means for supplying the cooling water from said water supply tank to said water cooling passage in said hydrogen cooled electrical machine, comprising the steps of

i. blowing a carrier air at a predetermined constant flow rate to said upper space of said water supply tank so as to drive hydrogen gas accumulated in said upper space through said air pipe;

ii. measuring hydrogen gas concentration in said carrier air flowing through said air pipe; and

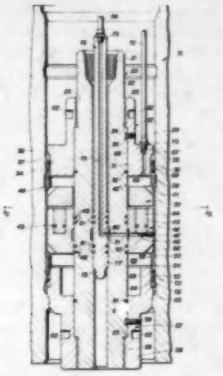
iii. judging whether any defect develops in said water cooling system or not, from the concentration measured.

4,373,380

TEST TOOL FOR SUB-SEA WELL HEAD HOUSINGS AND METHOD OF TESTING

John H. Mayo, 404 Alonda Dr., Lafayette, La. 70503

Filed Dec. 9, 1980, Ser. No. 214,674
Int. Cl.³ G01M 3/28
U.S. Cl. 73—40.5 R **11 Claims**



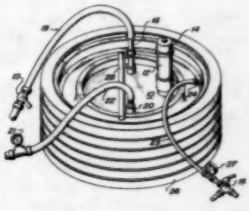
1. A method of testing a sealing surface to determine the degree of sealability of the surface, comprising pressure activating a seal in contact with said surface under a selected degree of activating pressure and maintaining the activating pressure constant for an interval, applying a test pressure to said surface and seal at a level of pressure above said activating pressure sufficient to cause leakage of fluid between said surface and seal, holding the test pressure constant for an interval while allowing a condition of pressure equilibrium between said activating and test pressures to occur evidenced by the stopping of leakage between said surface and seal, and recording the equilibrium pressure to establish the degree of sealability of said surface.

4,373,381

MANHOLE LEAKAGE INDICATOR AND METHOD FOR USING

Leon Kulp, 426 Bridge St., Catasauqua, Pa. 18032, and Donald E. Noggle, 102K Village Round, Wescosville, Pa. 18106

Filed Jan. 29, 1981, Ser. No. 229,337
Int. Cl.³ G01M 3/28
U.S. Cl. 73—40.5 R **5 Claims**



1. An apparatus for testing leakage from manholes comprising:

(a) a generally circular rim of rigid construction

(b) an inflatable bag circumscribing said rim, said rim and bag resting on

(c) a generally circular bottom plate to form an assembly, said assembly having a radius of somewhat less than the manhole to be tested;

(d) gas inlet means connected to said bag to allow its inflation and deflation;

(e) gas inlet means extending longitudinally through said assembly to allow the introduction of a gas into said manhole after said assembly is in place;

(f) means associated with said assembly adapted to receive a gauge intended to measure gas pressure of the manhole;

(g) a duct extending longitudinally through said assembly from the rim side to the bottom plate side;

(h) cap means for said duct at the rim side; and,

(i) means within said duct for releasably securing a cable to a wall of said duct whereby a cable may be secured at one end to said assembly and at its other end to a wall of said manhole.

4,373,382

METHOD OF ASCERTAINING THE HYDRATING ACTION OF A PRODUCT TO BE APPLIED TO THE SKIN

Nicole A. A. Brun, Geneva, Switzerland, assignor to Labiol S.A., Switzerland

Filed May 1, 1981, Ser. No. 259,669

Claims priority, application Switzerland, Jul. 9, 1980, 5242/80

Int. Cl.³ G01N *33/15, 13/00*

U.S. Cl. 73—53 **5 Claims**

1. Method of ascertaining the hydrating effect of a product to be applied on the skin, which comprises the steps of applying the product to be tested on at least one portion of at least one first sample of a vegetable, storing this first sample and at least another sample of the same vegetable but untreated under the same storage conditions, and finally comparing the evolution of the surface condition of the first and second samples.

4,373,383

DEVICE FOR BURNOFF OF A MEASURING RESISTOR

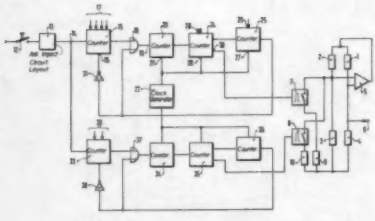
Günther Plapp, Filderstadt, and Peter Romann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,843

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927378

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—118 **13 Claims**



1. A device for burnoff of a measuring resistor, in particular a hot wire or hot film in the air flow rate meter of an internal combustion engine comprising:

an open-loop control device coupled with a trigger circuit which emits a repeating output signal in response to the appearance of predetermined operational characteristics, said open-loop control device increasing the flow of electrical current through said resistor during the burnoff procedure.

4,373,384

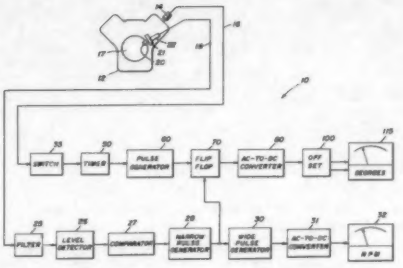
DIESEL ENGINE TIMING APPARATUS

Gene E. Olson, Kenosha, Wis.; Jerome A. Thompson, Milford, Mich.; Donald D. Grover, Kenosha, Wis.; Christopher B. Stout, Kenosha, Wis.; Thomas P. Becker, Kenosha, Wis., and Glenn A. Kaufman, Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jul. 23, 1981, Ser. No. 286,186

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **11 Claims**



1. Diesel engine timing apparatus for a diesel engine having a rotating part with mark means that passes a fixed point a predetermined number of degrees after top dead center of a selected cylinder, said diesel engine timing apparatus comprising a luminosity probe adapted to be coupled to the selected cylinder for producing a first recurring electrical signal in response to the recurring light produced in the selected cylinder during combustion therein, timer means for producing a recurring timer signal commencing with the electrical signal but having a substantially greater duration, a first pulse generator responsive to the leading edge of the timer signal for producing a train of first pulses each having a duration substantially shorter than the duration of the timer signal, means adjacent to the fixed point for producing a second recurring electrical signal in response to the rotating mark means, a second pulse generator responsive to the leading edge of the second recurring electrical signal for producing a train of second pulses, circuit means coupled to said first and second pulse generators and being responsive to each first pulse to start an output pulse and being responsive to each second pulse to terminate the output pulse, and means for displaying information corresponding to the duration of the output pulses.

4,373,385

FLUID PRESSURE DETECTION

Raymond Boutteville, Bois D'Arcy, and Thierry Febvret, Versailles, both of France, assignors to Intertechnique, Plaisir, France

Filed Feb. 20, 1981, Ser. No. 236,555

Claims priority, application France, Feb. 27, 1980, 80 04381

Int. Cl.³ B60C *23/04*; G01L *9/10*

U.S. Cl. 73—146.5 **7 Claims**

1. A fluid pressure detector comprising

a housing having an axis,

transmission shaft means mounted for rotation about said axis and retained against axial movement, having an end portion projecting out of said housing for mechanical connection with a rotatable member in which the pressure is to be detected,

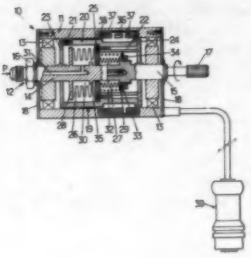
a unit slidably non-rotatably connected to said rotatable shaft,

deformable wall means coaxial to said shaft means and cooperating with a surface of said unit to define a pressure chamber, said surface being constructed for the pressure in said chamber to exert a resultant axial pressure force on said unit,

passage means in said shaft means opening into said projecting end portion and into said chamber,

resilient return means operatively connecting said unit and shaft and exerting an axial force on said unit,

a differential transformer carried by said housing and having excitating and receiving coil means,



and a ferromagnetic body carried by said unit arranged to provide a coupling effect between said coil means which varies in dependence on the axial location of said unit along said shaft.

4,373,386

DIRECTION SENSITIVE FLOW VELOCITY METER AND SENSING PLATE TO BE USED ON IT

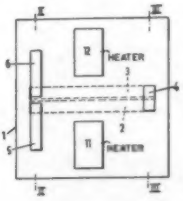
Jacob P. Schuddemat, Huizen, and Johan H. Huijsing, Den Hoorn, both of Netherlands, assignors to Brooks Instrument B.V., Veenendaal, Netherlands

Filed Jul. 3, 1980, Ser. No. 165,608

Claims priority, application Netherlands, Jul. 9, 1979, 7905356

Int. Cl.³ G01F 1/68; G01P 5/10

U.S. Cl. 73—189 8 Claims



1. In a direction sensitive flow velocity meter for a fluid, including a sensing plate in thermal contact with the fluid, said sensing plate having a sensor part for producing electrical signals responsive to differences in temperature in said fluid and means for generating heat to produce a temperature differential in said fluid, and electronic means for processing the electric signals furnished by the sensor part to produce a signal indicative of the flow of the fluid, the improvement wherein said sensing plate comprises an integrated circuit, wherein said sensor part comprises at least one Seebeck detector integrated in said integrated circuit, and wherein said means for generating heat comprise one or more heating elements integrated in said integrated circuit.

4,373,387

AIR FLOW METER

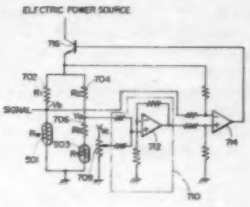
Yutaka Nishimura; Hiroshi Kuroiwa; Tadashi Kirisawa, and Yoshishige Oyama, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 14, 1980, Ser. No. 168,736

Claims priority, application Japan, Jul. 24, 1979, 54/94725

Int. Cl.³ G01F 1/68

U.S. Cl. 73—204 13 Claims



1. An air flow meter comprising an air flow velocity measuring resistor and a temperature compensating resistor installed in an air flow passage through lead wires exposed therein and supporting said resistors, said air velocity measuring resistor being heated to a predetermined temperature higher than that of said air drawn in said passage, said temperature compensating resistor being heated to a temperature almost equal to that of said air drawn in, and said temperature compensating resistor being supported by lead wires having no less heat resistance than that of the lead wires supporting said air velocity measuring resistor.

4,373,388

LIQUID LEVEL MONITORING DEVICE

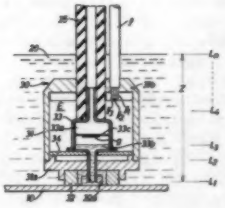
Sotoo Kitamura; Sigeyuki Akita, both of Okazaki, and Junji Kitagawa, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 3, 1980, Ser. No. 212,275

Claims priority, application Japan, Dec. 25, 1979, 54-181059[U]

Int. Cl.³ G01F 23/18

U.S. Cl. 73—301 11 Claims



1. A liquid level monitoring device adapted for use in a container in which an amount of liquid is stored, said monitoring device comprising:

a casing arranged to be immersed in the stored liquid within said container, said casing having first and second ports and being integrally provided with a support member to be attached to a portion of the inner wall of said container, and said second port being integrally formed with a tubular extension having an open end to be located adjacent to the bottom of said container;

an elongated tube connected at its one end to said first port and positioned at its other end externally of said container;

a flexible diaphragm assembled within said casing to subdi-

vide the interior of said casing into first and second chambers respectively in open communication with said first and second ports, said first chamber being communicated with the atmospheric air through said tube, and said second chamber permitting the immerse of liquid through said second port thereinto such that an amount of the atmospheric air within said second chamber is compressed in dependence upon the amount of the stored liquid and that said diaphragm is flexed by a difference in pressure between said first and second chambers;

electric circuit means including a pressure transducer secured to said diaphragm to detect the rate of flexure of said diaphragm and including a control circuit to produce an electric signal indicative of the liquid surface level dependent upon the detected rate of flexure of said diaphragm; and

an indicator responsive to the electric signal from said control circuit for indicating the surface level of the stored liquid.

4,373,389

DEVICE FOR CAPACITIVE LEVEL MEASUREMENT

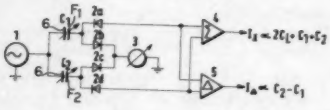
Rainer Decker, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronic m.b.H., Hamburg, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 193,930

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1979, 2941652

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C **7 Claims**



1. A capacitance type measuring device for measuring the level of liquid in a container, comprising:

(a) first, second and third electrodes arranged in said container to be in contact with said liquid, said electrodes being coextensive over a height (H) embracing at least the possible level variations of said liquid;

(b) said second electrode (F_1) being opposed to part of said first electrode for forming therewith a first measuring condenser having said liquid as a dielectric and having its capacitance responsive to the level and dielectric constant of said liquid;

(c) said third electrode (F_2) being opposed to another part of said first electrode and forming therewith a second measuring condenser having said liquid as a dielectric and having its capacitance responsive to the level and dielectric constant of said liquid;

(d) at least one of said second and third electrodes having its width varying over its height, and the dependence of the width from the height being different in said second and third electrodes;

(e) a means for applying electrical signals to said first and second measuring condensers and for obtaining therefrom first and second output signals responsive to the capacitances of said first and second condensers, respectively, which in turn are differently responsive to the level and dielectric constant of said liquid owing to said different dependence of width from height; and

(f) means for processing said first and second output signals together so as to obtain at least one of a measuring signal responsive only to said liquid level irrespective of said dielectric constant and a measuring signal responsive only to said dielectric constant irrespective of said level.

4,373,390

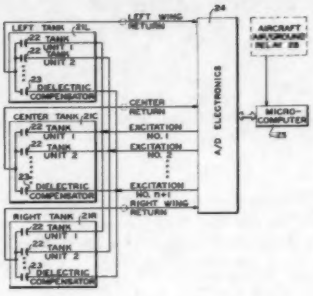
LIQUID GAGING SYSTEM COMPATIBLE WITH MULTIPLE CHARACTERIZATION OF EACH SENSOR

Martin J. van Dyke, Brooklyn Park; Dwight D. Colby, Roseville, and William R. Dougherty, St. Anthony, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 149,795, May 14, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,636

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C **49 Claims**



1. A liquid gaging system comprising:

a sensor for providing a liquid measurement signal related to a liquid depth at a particular location in a tank;

storage means for storing data including characterization parameters, the storage means comprising means for storing look up tables, there being a first look up table for storing at least a first parameter and a second look up table for storing at least a second parameter, each parameter being based on tank shape and volume and on sensor location, each parameter defining a relationship between a liquid depth and a volume related to a liquid quantity; and

determining means for selecting an appropriate look up table and for determining a value related to a liquid quantity in the tank based on the liquid measurement signal and the data, the determining means being connected to the sensor and to the storage means.

4,373,391

RELATIVE HUMIDITY SENSITIVE MATERIAL

Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 52,083, Jun. 26, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 257,081

Int. Cl.³ H01C *13/00*

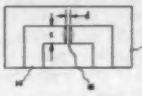
U.S. Cl. 73—335 **12 Claims**

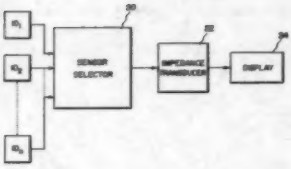
1. A relative humidity sensitive material comprising:

a mixture of at least one hygroscopic salt;

an at least partially electrically conductive metal based powder comprising a mixture of materials selected from the group consisting of Co_3O_4, Zr, and MnO_2; each said

salt having a cationic constituent selected from the group consisting of the alkali and alkaline earth metals and an





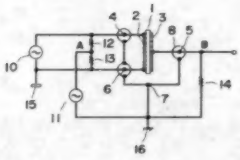
anionic constituent selected from the group consisting of chlorate, perchlorate, and chloro aluminate; and
an inert binder.

4,373,392

SENSOR CONTROL CIRCUIT

Shunichi Nagamoto, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 1, 1980, Ser. No. 165,007
Claims priority, application Japan, Jul. 4, 1979, 54-84646
Int. Cl.³ G01W *1/00*
U.S. Cl. 73—336.5 **7 Claims**



1. A sensor control circuit including a sensing device comprising a planar sensor element having two opposite major surfaces, first and second plate electrodes each having a predetermined exothermic resistance value and disposed on said two opposite major surfaces of said sensor element, two lead wires extending from said first plate electrode and connected to a power source whereby a current flowing through said lead wires and said first plate electrode causes said first plate electrode to generate heat, an additional lead wire extending from said second plate electrode, a pair of impedance elements connected in series between said two lead wires extending from said first plate electrode and a second power source interposed between the junction point of said pair of impedance elements and said additional lead wire extending from said second plate electrode and used for detecting the impedance of said sensor element.

4,373,393

METHOD FOR DETERMINING THE AGE OR AUTHENTICITY OF TIMBER STRUCTURES

Herman J. Heikkenen, 802 Preston Ave., Blacksburg, Va. 24061

Filed Jul. 19, 1978, Ser. No. 926,223
Int. Cl.³ G01N *33/46*
U.S. Cl. 73—432 R **1 Claim**

1. A method for determining the age or authenticity of a timber structure comprising:

(a) taking a plurality of radial core samples from several portions of a timber structure,

(b) taking at least one radial core sample from each of several mature living trees of one or more species or trees of one or more species whose death date is known, from at least one well drained, site in the general vicinity of the timber structure,

(c) measuring the absolute radial width of each annual growth ring for each of the samples taken in steps (a) and (b),

(d) comparing the width of each annual growth ring to the width of previous annular growth ring to determine if it is greater, less or equal in width to the previous annular growth ring, for each of the samples taken in steps (a) and (b),

(e) comparing the samples taken in step (a) to determine index years in which the annual growth ring relative to the preceding ring coincides in at least 80 percent of the samples,

(f) comparing the samples taken in step (b) to determine index years in which the annual growth ring relative to the preceding ring coincides in at least 80 percent of the samples,

(g) correlating on a first chronological scale the frequency pattern of the index years determined in step (e) with the frequency pattern of the index years determined in step (f) on a second chronological scale to establish a common period in the life of trees sampled in step (b) and trees used to make the timbers sampled in step (a),

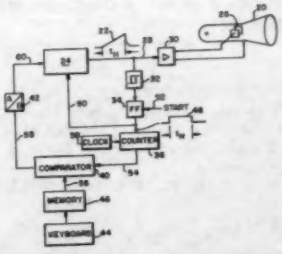
(h) determining the last year of growth of the samples obtained in step (a) by comparing chronologically on the first chronological scale the date of the outermost growth ring of the samples taken in step (a) to the date of the outermost growth ring of the samples taken in step (b), on the second chronological scale.

4,373,394

ULTRASONIC TEST APPARATUS AND SWEEP VOLTAGE GENERATOR FOR USE THEREIN

Peter Renzel, Düren, and Werner Vermöhlen, Elsdorf, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson Incorporated, Stratford, Conn.

Filed Oct. 21, 1980, Ser. No. 199,245
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 29452004
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—606 **22 Claims**



1. Apparatus for generating a voltage which cyclically varies linearly in magnitude with time comprising:

capacitor means;
means for supplying charging current to said capacitor means whereby a voltage which varies linearly with time will appear across said capacitor means;
a source of clock pulses;
counter means, said counter means being connected to receive clock pulses from said source;
means responsive to the initiation of charging of said capacitor means from a first voltage level for delivering clock pulses from said source to said counter means;
means responsive to the voltage across said capacitor means reaching a second voltage level for terminating the delivery of clock pulses to said counter means whereby said counter means will provide a signal commensurate with the time required for said capacitor means to charge from the said first voltage level to the said second voltage level;
selector means, said selector means providing a variable signal commensurate with a desired time for the voltage across said capacitor means to vary from said first voltage level to said second voltage level;
comparator means connected to said counter means and to said selector means for providing an error signal commensurate with any difference between the measured and desired times; and
means responsive to any error signal provided by said comparator means for varying the rate at which said capacitor means is charged from said current supplying means.

16. Apparatus for displaying the results of the non-destructive testing of an object with ultrasonic energy comprising:
means responsive to ultrasonic energy reflected from inhomogenities in a test object for converting said reflected energy into electrical signals;
a cathode ray tube;
means applying said signals commensurate with reflected echoes to the vertical electron beam deflection plates of said cathode ray tube;
adjustable sweep voltage generator means for producing a deflection signal having a sawtooth waveform and for applying said signal to the horizontal deflection plates of said cathode ray tube, the final amplitude of said sawtooth waveform signal and the slope thereof being pre-defined;
data entry means for generating a signal commensurate with a desired image region in units of length within the test object, said data entry means also permitting the generation of signals commensurate with characteristic values of the material comprising the test object and the construction of the ultrasound generator;
microprocessor means, said microprocessor means including data and instruction storage memories and a computing circuit, said microprocessor means computing a sawtooth waveform voltage slope corresponding to the desired image region and a delay time commensurate with the appropriate time for initiation of the sawtooth voltage subsequent to the generation of the examining ultrasonic energy; and
means responsive to the slope and delay time signals generated by said microprocessor means for adjusting said sweep voltage generator to vary the slope of the sawtooth waveform voltage and for initiating the operation of said sweep voltage generator.

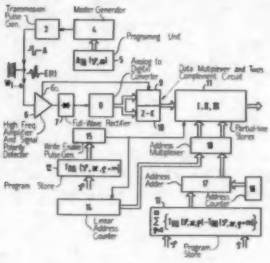
4,373,395

APPARATUS FOR ULTRASONIC SCANNING

Jacques Borburgh, Poxdorf; Gerhard Naefe, Erlangen, and Helmut Rost, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,779
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2942049
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—607 **17 Claims**

1. Ultrasonic scanning apparatus including electronic delay circuitry for delaying echo signals produced in use by a multiplicity of transducers of the apparatus such that the phase relationship between respective echo signals is substantially maintained for each of a succession of ultrasonic scanning lines, the circuitry comprising a multiplicity of partial-line digital stores, each partial-line digital store being adapted for storing data in digital form corresponding to a part of an ultrasonic scanning line, a group of partial-line digital stores being associated with each of the transducers such that the total number of partial-line digital stores available for association with each transducer has a total storage capacity substantially less than that required for storing the data from the transducer which is to be stored during the generation of an ultrasonic scanning line, each group comprising at least three partial-line digital stores and being operated such that readout of part of the data of one ultrasonic scanning line makes room for the



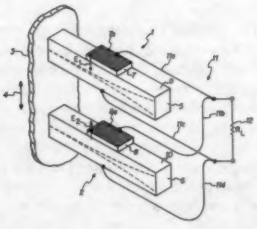
storage of a further part of the data of the same ultrasonic scanning line, and control means arranged such that, in use, data corresponding to echo signals is sequentially written in to the partial-line digital stores of the group for each of the transducers, beginning with the first such transducer to receive an echo signal, until at least the first partial-line digital store of the group for the last such transducer to receive an echo signal has been supplied with data, said control means being operative for simultaneously reading out stored data from all of the groups of partial-line digital stores after the time when the group of partial-line digital stores for the last such transducer to receive an echo signal has been supplied with data and before the group of partial-line digital stores associated with the first such transducer to receive an echo signal has exceeded its storage capacity.

4,373,396

MECHANICAL FILTER WITH ACOUSTIC SENSING

Robert A. Johnson, Tustin, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 22, 1980, Ser. No. 189,418
Int. Cl.³ G01H *13/00*; G01L *23/22*
U.S. Cl. 73—651 **8 Claims**



1. A mechanical bandpass filter driven by a velocity source, comprising:
a first flexure mode cantilever bar resonator having a reso-

nant frequency f_1 and nodally connected to said velocity source, and having transducer means for generating an electrical output from flexural vibration;

a second flexure mode cantilever bar resonator having a resonant frequency f_2 and nodally connected to said velocity source, and having transducer means for generating an electrical output from flexural vibration;

means coupling the electrical outputs of said transducer means to define a passband frequency range corresponding to the range between and around f_2 and f_1 due to increased amplitude of vibration, and to define a stopband by signal cancellation with increasing attenuation farther away from said passband; and

impedance means R_L connected across said electrical outputs of said transducer means for controlling the passband ripple of said mechanical bandpass filter.

4,373,397

PIEZORESISTIVE PRESSURE CELL

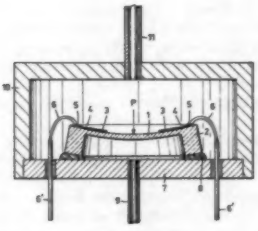
Hans W. Keller, St.-Gallerstr. 106, CH-8404 Winterthur, Switzerland

Filed Jan. 30, 1981, Ser. No. 229,880

Claims priority, application European Pat. Off., Feb. 6, 1980, 80100603.2

Int. Cl.³ G01L 9/06

U.S. Cl. 73—721 **5 Claims**



1. A piezoresistive pressure cell of generally cylindrical shape, comprising a front end cell wall constituting a metering diaphragm having at least one strain-responsive resistor secured thereon, said front cell wall consisting essentially of a solid insulating material, and which extends over an annular cylinder barrel portion having a uniform wall thickness substantially greater than the cross-sectional thickness of said metering diaphragm, said pressure cell further comprising a rigid rear cell wall upon which the cylinder barrel portion is sealed by a fixing material applied between the cylinder barrel end face and the rear cell wall, wherein the fixing material is a plastic material adapted to undergo stresses including rubber elastic elongation and shear.

4,373,398

INDICATING GAUGE WITH PRESSURE RELIEF VALVE

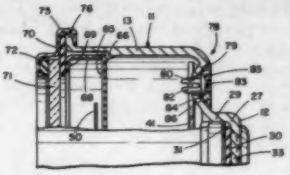
George M. Ponczek, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Feb. 2, 1981, Ser. No. 230,447

Int. Cl.³ G01L 19/06, 7/08

U.S. Cl. 73—738 **18 Claims**

1. An indicating instrument of the type that responds to pressure variations representing changes in a sensed parameter, comprising; housing means, a pressure responsive assembly in the housing means adapted to be connected to a pressure source that varies in accordance with the sensed parameter, an indicator in the housing means connected to be driven by the pressure responsive assembly so that the indicator provides a visual representation of variations in the sensed parameter, said housing means being sealed to prevent the entry of foreign material into the housing, and valve means for preventing an excessive increase in pressure in the housing means including an aperture in the housing means, a plug in the aperture constructed so that it may not pass inwardly into the housing means, and an adhesive covering and sealing the plug, said



adhesive controlling the internal pressure in the housing means at which the plug will be released from the housing means aperture thereby relieving pressure within the housing means.

4,373,399

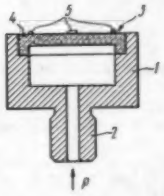
SEMICONDUCTOR STRAIN GAUGE TRANSDUCER

Alexei V. Beloglazov, poselok Khlebnikovo, Stantsionnaya ulitsa, 5, kv. 12, Moskovskaya oblast; Vladimir E. Beiden, K-482, korpus 4, kv. 2, Moscow; Georgy G. Iordan, ulitsa 26 Bakinskikh komissarov, 3, kv. 1, Moscow; Vladimir M. Karneev, Leningradskoe shosse, 8/2, kv. 346, Moscow; Vladimir S. Papkov, K-498, korpus 405, kv. 18, Moscow; Vladimir M. Stuchebnikov, ulitsa Gotvalda, 15, kv. 51, Moscow; Viktor V. Khasikov, Sadovo-Spasskaya, ulitsa, 21, kv. 5, Moscow, and Mikhail V. Surovikov, K-527, korpus 906, kv. 170, Moscow, all of U.S.S.R.

Filed Feb. 5, 1981, Ser. No. 231,890

Int. Cl.³ G01B 7/16

U.S. Cl. 73—777 **4 Claims**



1. A semiconductor strain gauge transducer comprising: a sensitive element including a monocrystal sapphire substrate; epitaxial strain gauges made of silicon resistors of p-type conduction, arranged on said substrate and interconnected into a bridge or differential strain-sensitive circuit; a signal conversion unit whose input is connected to the output of said strain-sensitive circuit, wherein the hole concentration in the silicon is $3.5\text{-}10^{19}$ to $3\text{-}10^{20}$ cm^{-3}.

4,373,400

SIGNAL GENERATOR FOR ELECTROMAGNETIC FLOWMETERS

Toshio Sekiguchi, Tokyo, Japan, assignor to Hokushin Elect. Works, Ltd., Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,249

Claims priority, application Japan, Dec. 17, 1979, 54-162847

Int. Cl.³ G01F 1/60

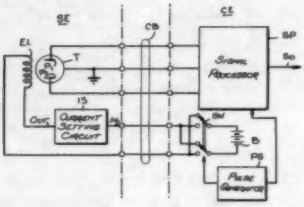
U.S. Cl. 73—861.12 **4 Claims**

1. In an electromagnetic flowmeter having a signal generator whose signal is applied to a converter, said generator comprising:

A. a flow tube having an insulated liner through which the fluid to be metered flows, and a pair of diametrically-opposed electrodes;

B. a coil to establish an electromagnetic field in the flow tube to be intercepted by the fluid to induce a signal in the electrodes, which signal is applied to the converter;

C. an excitation circuit to derive an excitation current from an external power supply and to feed the current to said coil, said power supply including a d-c source and a periodically actuated reversing switch coupled thereto to yield an alternating rectangular excitation current wave, each cycle of which has a current pulse of one polarity followed by a current pulse of opposite polarity; and



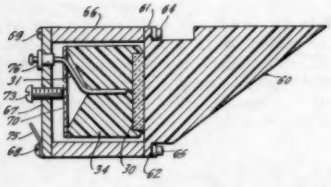
D. a current-setting circuit coupled to said excitation circuit for setting the alternating excitation current to a value establishing a constant relationship between the fluid flow rate and said signal, said current setting circuit being constituted by first and second pairs of diodes connected in series opposition, said pairs being connected in parallel opposition to define a rectifying bridge, said reversing switch being connected through the parallel pairs to said coil, and a constant-current network connected between the junction of the diodes in the first pair and the junction of the diodes in the second pair to maintain the pulses of opposite polarity in each cycle at a constant level.

4,373,401

TRANSDUCER STRUCTURE AND MOUNTING ARRANGEMENT FOR TRANSDUCER STRUCTURE FOR CLAMP-ON ULTRASONIC FLOWMETERS

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Filed May 5, 1980, Ser. No. 146,530
Int. Cl.³ G01F *1/66*; G01N *29/02*
U.S. Cl. 73—861.18 **9 Claims**



1. A transducer structure comprising, in combination:

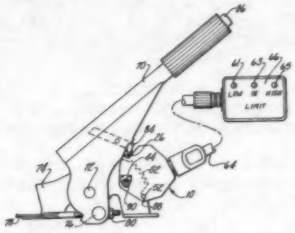
a transducer crystal having electrodes which are energizable to produce mechanical energy; a sonic coupling body having a sonic output surface coupled to one surface of said crystal and conducting sonic energy from said one surface of said crystal to its said sonic output surface; said sonic coupling body comprised of a plastic material having sonic-temperature characteristics which are sufficiently close to those of steel to enable coupling to a steel pipe for good operation over a wide temperature range; said sonic coupling body having the shape of a rectangular wedge; the base of said wedge coupled to said one surface of said crystal; one side of said wedge defining said sonic output surface.

4,373,402

METHOD AND APPARATUS FOR MEASURING CABLE TENSION IN A PARKING BRAKE ASSEMBLY

Gary L. Barrett, Union Lake, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Filed Mar. 9, 1981, Ser. No. 242,095
Int. Cl.³ G01L *5/10, 5/28*
U.S. Cl. 73—862.39 **14 Claims**



1. Apparatus for measuring the tension in a cable of a parking brake assembly having a lever arm pivotally connected to a mounting bracket, said apparatus comprising:

a force measuring transducer device including a load receiving surface;

at least one flexure element connected to the load receiving surface;

means on the flexure element for converting strain developed therein to an electrical signal as a function thereof; and

mounting means for securing the device on the bracket of the parking brake assembly such that the lever arm engages the load receiving surface when the lever arm has been raised to a given position;

whereby the tension on the cable may be adjusted until the output of the device indicates that the appropriate amount of tension on the cable has been obtained, the force applied by the lever arm to the load receiving surface of the transducer device being a function of the cable tension.

11. A method of measuring the tension on a cable in a parking brake assembly having a lever arm pivotally mounted on a bracket and latching means for selectively holding the lever arm in an adjusted position, said method comprising:

releasing the latching means and raising the lever arm to a given position;

inserting a force measuring transducer device on the bracket;

releasing the lever arm so that it comes into contact with the transducer device; and

converting the force applied by the lever arm to electrical signals by way of flexure elements in the transducer device to provide an output which is a function of the tension on the cable.

4,373,403

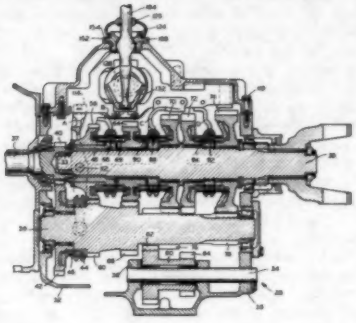
CONTROL FOR MECHANICAL TRANSMISSION

Theodore A. Malott, Jackson, and Barry L. Frost, Marcellus, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 29, 1981, Ser. No. 229,472
Int. Cl.³ G05G *9/12, 5/10*
U.S. Cl. 74—337.5 **10 Claims**

1. A control for a transmission having multiple input portions and multiple output portions in which a plurality of speed ratios are provided by actuating selected pairs of input and output portions, comprising:

a pair of shift rails;
an axially movable and rotatable control shaft;
a pair of cam members mounted on the control shaft so as to move and rotate therewith;
each shift rail having a cam follower surface;
one of the cam members positioned on the control shaft so that it is aligned with the cam follower surface of one of the shift rails when the other of the cam members is positioned to be aligned with the other of the shift rails;
the one cam member adapted to cooperate with the cam follower surface of the one shift rail to effect movement of



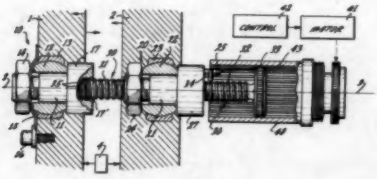
the respective shift rail upon rotation of the control shaft in a chosen direction whereby one of the input portions is actuated;
the other cam member adapted to cooperate with the cam follower surface of the other shift rail to effect movement of the respective shift rail upon said rotation of the control shaft in a chosen direction whereby one of the output portions is actuated; and
the movement of the one shift rail commences before and terminates during the movement of the other shift rail whereby the movements of the pair of shift rails are overlapped during rotation of the control shaft.

4,373,404

DIFFERENTIAL SCREW ACTUATOR

Theodore A. Heinz, Simi Valley, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 30, 1980, Ser. No. 164,417
Int. Cl.³ F16H *1/18*
U.S. Cl. 74—424.8 B **8 Claims**



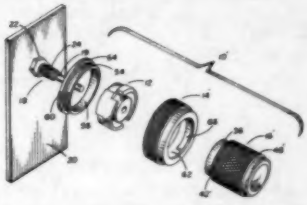
1. In a differential actuator for precision adjustment of spacing between a first and a second plate under utilization of a screw, there being first threaded means in the first plate and second threaded means in said second plate having different pitches, the screw threadedly engaging the first and second threaded means, the improvement comprising in combination first means for preventing rotation of the first threaded means during rotation and feedthrough of the screw; and
second means for preventing rotation of the second threaded means for and over a particular range only, while permitting rotation of the second threaded means with the screw in an adjoining range of rotational displacement of the screw, so that the spacing is coarsely adjusted by direct screw action of the screw in the first threaded means, and finely adjusted by differential screw action when rotation of the second threaded means is prevented.

4,373,405

MOLDED PLASTIC CONTROL LOCK KNOB WITH PUSH AND/OR PULL FEATURE

Ronald J. Geil, Vermilion, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 3, 1980, Ser. No. 183,842
Int. Cl.³ G05G *5/16, 1/08*
U.S. Cl. 74—531 **9 Claims**



1. A locking device for use with an adjustable rotary control member of the type having a push and/or pull function, said rotary control member having a rotary shaft fixedly mounted through a panel, said locking device comprising:
a locking shoe assembly having a means for fixedly attaching said locking shoe assembly to said panel so as to remain rotationally fixed thereto wherein the rotary shaft extends axially through said locking shoe assembly, a circumferential receiving slot, and at least one locking shoe integrally attached at one end to said locking shoe assembly with an internally inclining outer cam surface wherein the distal other end of said locking shoe is free to move radially inward into said receiving slot when force is applied thereto;
an annular locking knob circumferentially mounted over said locking shoe assembly so that said shaft of said rotary control member is in axial alignment and extends through said locking knob and wherein said locking knob is free to move rotationally about said locking shoe assembly, said locking knob having at least one internally inclining internal cam being dimensioned so as to be closely adjacent with said internally inclining outer cam of said locking shoe when said locking knob is in an unlocked position and adapted to contact said internally inclined outer cam of said locking shoe when said locking knob is rotated into a locked position forcing the free end of said locking shoe into said receiving means;
an annular retention ring circumferentially mounted over said locking shoe assembly, so as to be located between said panel and said annular locking knob, said annular retention ring being dimensioned so as to fit loosely over said locking shoe assembly but not over said at least one locking shoe, said annular retention ring being located between said panel and said at least one locking shoe, said annular retention ring being attached to said annular locking knob so as to hold said annular locking knob in a longitudinal position with respect to said panel; and
a control knob mounted on said shaft of said rotary control device, said control knob having an attachement means for attaching said control knob to said shaft of said rotary control member so that rotation of the control knob will rotate said shaft of said rotary control device and said shaft of said rotary control device can be pushed and/or pulled, a land portion integrally attached to said knob and adapted to fit within said circumferential receiving slot of

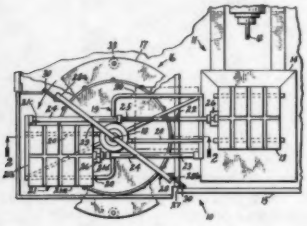
said locking shoe assembly, so that when said locking knob is in said unlocked position said control knob is free to rotate and to be pushed and/or pulled and when said locking knob is in said locked position said at least one locking knob internal cam forces said at least one locking shoe into said receiving slot binding said land portion in said receiving slot thus preventing said control knob from being rotated and from being pushed and/or pulled.

4,373,406

FULL ACCESS PALLET SHUTTLE GUARDING

Tadeusz W. Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 1, 1980, Ser. No. 174,441
Int. Cl.³ F16P *3/04*
U.S. Cl. 74—613 **3 Claims**



1. In a machine tool pallet transfer system having a pair of pallets oppositely disposed on a rotatable deck section about a generally vertical rotary transfer axis and movable along respective horizontal linear transfer axes toward and away from said pallet transfer system, an improved guard comprising:

(a) a guard base affixed to said rotatable deck section of said pallet transfer system; and

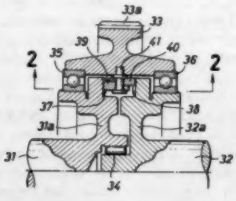
(b) a planar guard body, affixed to said base and vertically disposed along a horizontal line passing through said rotary axis at an angle oblique to said linear transfer axes, said planar guard body vertically extending to a point above said pallets, and horizontally extending to a diameter defined by a radial line from said vertical axis to the extreme edges of rotating pallets.

4,373,407

CLUTCH MECHANISM FOR POWER TRANSMISSION SYSTEM

Kiyokazu Okubo, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,416
Claims priority, application Japan, Nov. 19, 1979, 54-149694; Nov. 19, 1979, 54-149695; Nov. 19, 1979, 54-149696; Dec. 26, 1979, 54-169645
Int. Cl.³ F16H *35/04*; F16D *47/04*
U.S. Cl. 74—650 **8 Claims**



1. A clutch mechanism for a power transmission system having one drive member and two driven members, comprising:

at least one pair of clutch members interposed between said drive member and said two driven members so as to transmit the rotational power of said drive member to said driven members independently of each other when said drive member rotates;

said pair of clutch members being constructed so as to operatively cooperate with said drive member and said drive members such that one of said driven members, which is rotating at a higher speed than said drive member due to external force, is set free from said drive member while said power from said drive member is transmitted to the other driven member;

said pair of clutch members comprising a pair of pawls which are hingedly connected in a rocking manner to said drive member and which are biased to be opened;

said two driven members being respectively formed with a radially inner row of helical teeth and a radially outer row of helical teeth, said inner and outer rows of helical teeth being arranged to face each other and being dimensioned and shaped to engage with and disengage from said pawls;

the distance between the leading ends of said pawls at the minimum angle therebetween being set to be larger than the distance between the corresponding opposed protruding portions of said inner and outer rows of said helical teeth and smaller than the distance between the protruding portions of one row of said helical teeth and corresponding opposed recessed portions of the other row of said helical teeth;

said two driven members having a common substantially horizontal axis; and

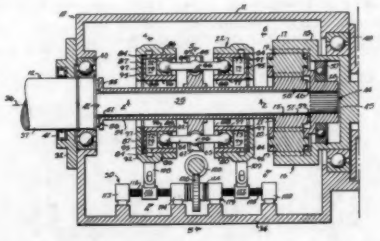
said pair of pawls being hingedly movable to substantially the radial direction of said common axis.

4,373,408

VARIABLE RATIO FLUID-MECHANICAL DRIVE APPARATUS

Ned D. Mills, West Richland, Wash., assignor to Varitran, Inc., Richland, Wash.

Filed Jun. 16, 1980, Ser. No. 160,014
Int. Cl.³ F16H *47/04*
U.S. Cl. 74—687 **12 Claims**



1. A variable ratio fluid-mechanical drive apparatus comprising:

a housing;

a planetary gear set mounted within the housing having a ring gear member, a planetary gear carrier member and a sun gear member with complementary ring gear, planetary gears and sun gear in intermeshing engagement for providing a wide range of speed ratios;

a power input drive means operatively connected to one of the planetary members for driving the planetary gear set;

a power output drive means operatively connected to one of the other planetary members to enable the planetary gear set to drive the power output drive means;

a positive displacement pump unit having a first unit shaft mounted within the housing for rotation about a pump unit

axis in which the first shaft is operatively connected to the remaining planetary member to control the rotational speed of the remaining planetary member;

a positive displacement motor unit having a second unit shaft mounted within the housing for rotation about a motor unit axis in which the second shaft is operatively connected to the power output drive means to transfer torque between the second shaft and the power output drive means;

fluid connecting means operatively interconnecting the pump unit and the motor unit for communicating fluid between the pump unit and the motor unit;

wherein one of the positive displacement fluid units has:

(a) a plurality of piston rods extending axially in opposite directions with respect to the one unit shaft at radially and angularly spaced locations about the one unit shaft;

(b) means for maintaining the piston rods axially stationary with respect to the unit axis;

(c) each piston rod having axially stationary pistons mounted at respective rod ends;

(d) opposed piston cavity barrels mounted for orbital movement about the unit shaft and having a plurality of piston cavities receiving the pistons therein;

(e) barrel carrier means mounted within the housing rotatably supporting the cavity barrels for orbital movement about the one unit shaft and pivotally supporting the cavity barrels for pivotal movement about spaced tilt axes that are normal to and intersect with the one unit axis to orient the piston cavity barrels at varying orbital tilt angles about the tilt axes with respect to the unit axis; and

first control means operatively connected to the barrel carrier means for pivoting the barrels in unison in opposite directions about the tilt axes to vary the tilt angles of the barrels to vary the fluid displacement of the one unit in relation to the magnitude of the tilt angles.

4,373,409

COMBINATION CREEPER GEAR AND CONTROL SYSTEM FOR A TRANSMISSION

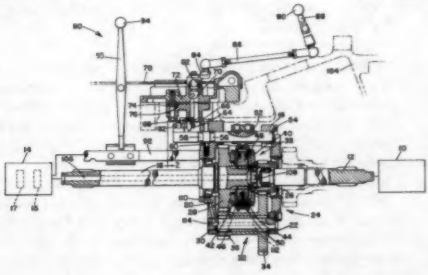
Vasile Benedek, Bruhl, and Volker D. Hückler, Mannheim, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Jul. 28, 1980, Ser. No. 172,616

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2930950

Int. Cl.³ F16H *3/02*

U.S. Cl. 74—745 **10 Claims**



1. A combination creeper gear and control system for a transmission having a range selector gear followed by a change speed gear, said combination comprising:

(a) an engine driven drive shaft;

(b) an input shaft extending into said transmission;

(c) a creeper gear mechanism comprising a drive gear mounted on said drive shaft, a driven gear mounted on said input shaft and a lay shaft aligned parallel to both said drive shaft and said input shaft having a compound gear mounted thereon, said compound gear having a first and a second gear, said first gear meshing with said drive gear and said second gear meshing with said driven gear;

(d) a synchronizer located between said drive gear and said driven gear, said synchronizer being selectively engageable between a direct mode wherein said drive shaft is directly connected to said input shaft and a creep mode wherein said drive shaft is connected to said input shaft by way of said lay shaft and said compound gear; and

(e) selector control means for activating said synchronizer between said direct mode and said creep mode, said selector control means including a first lever-actuated shift rod associated with said creeper gear mechanism, a second lever-actuated shift rod associated with said range selector gear, and a locking pin slideably positioned between said first and second shift rods, said locking pin being controlled by movement of said first and second shift rods such that said creep mode cannot be selected when said range selector gear selects a higher speed range but which can be selected in either a low speed forward range or a reverse range of said range selector gear.

4,373,410

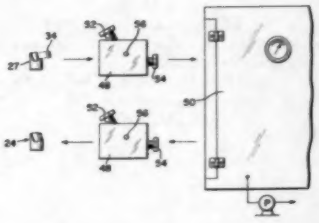
METHOD AND APPARATUS FOR FABRICATING DIAMOND STUD ASSEMBLIES

Kenneth Davis, 3410 W. Ohio, Midland, Tex. 79701

Filed Jul. 21, 1980, Ser. No. 170,840

Int. Cl.³ E21B *10/56*

U.S. Cl. 76—108 A **12 Claims**



1. Method for making a polycrystalline diamond stud assembly for a drill bit, comprising the steps of:

(1) making a support stud for supporting a polycrystalline diamond cutter element;

(2) providing a diamond cutter element;

(3) preparing the surface between said element and said stud so that the element can subsequently be fused to the stud;

(4) placing the stud of step (1) and the element of step (2) into a fixture;

(5) aligning the stud and element respective to one another so that the element is positioned in its operative cutting position respective to the stud;

(6) selecting a shim having a relatively high coefficient of thermal expansion respective to the stud, element, and fixture;

(7) placing the shim of step (6) adjacent to one of the outer face of the element and the lower terminal end of the stud;

(8) forcing the shim and stud towards one another to thereby force the element towards the stud; and, mechanically immovably holding the shim, stud, element, and fixture together in fixed relationship respective to one another;

(9) heating the fixture containing the stud, element, and shim until fusion occurs between the element and stud; whereupon, the coefficient of thermal expansion of the shim causes the stud and element to be forced towards one another with a force which increases in proportion to the temperature elevation;

(10) cooling the fixture of step (9), removing the stud and fused element from the fixture, thereby providing the aforesaid polycrystalline diamond cutter assembly.

7. Apparatus for making a polycrystalline diamond stud assembly for a drill bit, comprising:

a fixture, a cavity formed within said fixture for removably receiving a support stud and cutter element therewithin;

first and second abutment means located within said cavity and placed laterally respective to one another and connected to the fixture, said first abutment means has a surface formed thereon for engaging the stud of a stud assembly, said second abutment means has a face thereon for engaging the face of the element of a stud assembly;

one of said first and second abutment means being movable respective to the other of said first and second abutment means to cause a cutter assembly which may be located therebetween to be placed into compression;

one of said first and second abutment means includes a shim means made of a material having relatively high coefficient of expansion, said shim means being interposed between the stud assembly and one of said abutment means; said shim, stud, element, and fixture are mechanically held together in fixed relationship respective to one another;

an alignment means for enabling the element to be moved laterally respective to the stud after the stud and element have been received between said abutment means;

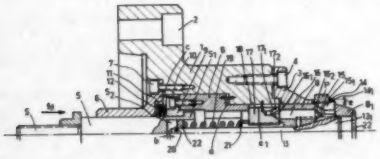
so that when the fixture containing the stud and element is heated, the element is fused to the stud with great force being exerted at the interface between the element and stud due to the difference in coefficient of expansion of the shim respective to the fixture, stud, and element.

4,373,411

EXPANSIBLE MANDREL

Georges Kanakaris, Tremblay, France, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Feb. 11, 1981, Ser. No. 233,456
Claims priority, application France, Feb. 19, 1980, 80 03548
Int. Cl.³ B23B *31/42*
U.S. Cl. 82—44 **11 Claims**



1. An expansible mandrel for loading and unloading a work member while the mandrel is rotating, said mandrel comprising:

a frame having an abutment;

a mandrel body slidable forwardly and rearwardly in said frame;

at least two slide members mounted for radial movement within first recesses in said body, said slide members each including:

a radial projection for pressing the work member against said abutment, and

an inclined surface facing radially inwardly;

a piston movable forwardly and rearwardly relative to said body, said piston including inclined surface means engageable with said inclined surfaces of said slides;

a first spring arranged for urging said piston rearwardly to bring said inclined surface means into engagement with said inclined surfaces and urge said slides radially outwardly into engagement with the work member;

a second spring for urging said body and slides forwardly;

a coupling rod movable:

forwardly by a first distance to become disengaged from said body to enable said body and slides to be pushed forwardly by said second spring, and further by a second distance to push said piston forwardly against the bias of said first spring,

rearwardly by said second distance to enable said first spring to push said piston rearwardly, and further by said first distance to engage said body to pull the latter rearwardly;

weight members mounted in second recesses of said body for radial movement;

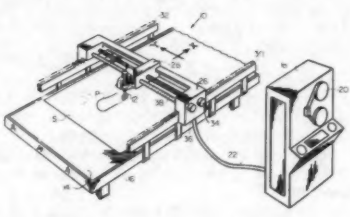
a mechanical linkage operably interconnecting said weight members and respective ones of said slides such that centrifugally-induced radial outward movement of said weight members produces radial inward movement of said slides and their projections when said piston is moved forwardly by said control rod and out of engagement with said slides, said linkage effecting radial inward movement of said weight members in response to radial outward movement of said sleeves produced by said piston when said coupling rod is moved rearwardly.

4,373,412

METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL WITH A CUTTING WHEEL

Heinz J. Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Jul. 10, 1980, Ser. No. 168,312
Int. Cl.³ D06H *7/00*; G06F *15/46*
U.S. Cl. 83—24 **6 Claims**



1. A method of cutting limp sheet material along predetermined lines of cut defining the contours of pattern pieces comprising the steps of:

providing in a program controlled cutting machine a support having a hard, smooth surface on which limp sheet material is positioned for cutting;

attaching limp sheet material to be cut to the hard, smooth surface of the support in a flat condition for cutting by spreading an adhesive directly on the support surface by spraying the adhesive in a stipple pattern on the support surface such that less than the entire area of the surface is provided with adhesive and laying the limp sheet material in contact with the adhesive on the surface so that only adhesive lies between the material and the hard surface;

placing a cutting wheel having a sharp peripheral cutting edge in engagement with the attached sheet material;

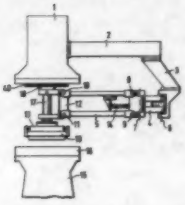
moving the cutting wheel and the attached sheet material relative to one another to advance the wheel along a closed and predetermined line of cut defining the contours of a pattern piece in accordance with a cutting program and simultaneously pressing the cutting wheel against the hard support surface with sufficient pressure to cause the cutting edge of the wheel to cut through the attached material to the support surface along the line of cut and sever a pattern piece from the surrounding material and then;

removing the cut pattern piece from the support surface and the surrounding material adhesively attached to the surface.

4,373,413
PUNCH PRESS APPARATUS FOR PLACEMENT AND ALIGNMENT OF A KNIFE HOLDER

Hans Mohrbach, Rieschweiler, Fed. Rep. of Germany, assignor to Ernst Mohrbach KG, Rieschweiler, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 215,078
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952010
Int. Cl.³ B26F 1/38
U.S. Cl. 83—123 7 Claims



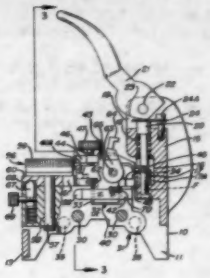
1. Apparatus for the placement and alignment of punch knives on material to be punched in a punch press, comprising a support, a first swivel arm having a first end and a second end with the first end pivotally attached to said support for pivotal movement about a vertical axis, a second swivel arm having a first end and a second end with the first end pivotally attached to the second end of said first swivel arm for pivotal movement about a vertical axis, said second swivel arm being pivotally mounted for pivotal movement about a horizontal axis, and a knife holder pivotally attached to the second end of said second swivel arm, said knife holder supported by said first and second swivel arms for movement along horizontal and vertical coordinates, said second swivel arm comprises a double-armed parallelogram arm with each arm of said double-armed parallelogram arm pivotal about a separate horizontal axis, means for effecting a restoring force on said swivel arm for returning said swivel arm to a horizontal position after it is displaced during a punching operation, said knife holder includes a tubular vertically aligned member extending upwardly from said knife holder, said second swivel arm is pivotally connected to said member, said tubular member forming a cylinder therein, a piston located in the lower end of said cylinder, an ejection plate secured to the lower end of said piston exteriorly of said cylinder, and means in communication with said cylinder for supplying a hydraulic medium thereto for displacing said piston and said ejection plate in the downward direction.

4,373,414
CODED KEY CUTTING DEVICE

Frank P. Agius, 909 Washington Ave., Alpena, Mich. 49707

Filed Oct. 6, 1980, Ser. No. 194,255
Int. Cl.³ B26F 1/12
U.S. Cl. 83—414 6 Claims

1. An improvement in a coded key cutting device, said device having a frame, means at one end of the frame defining a cutting area, first and second carriage assemblies movable relative to one another and to said frame, said first carriage assembly arranged for transverse movement on said frame and said second carriage assembly positioned on said first carriage assembly and arranged for movement axially thereof, said improvement comprising a first cam assembly on said frame arranged to impart movement on said first carriage assembly, said first cam assembly comprising a knob rotatably mounted on said frame, an annular flange on said knob, a cam configuration on said annular flange and a cam follower on said first carriage assembly engaging said cam, a secondary cam assembly on said first carriage assembly arranged to impart movement to said secondary carriage assembly, means for securing a key blank to said second carriage assembly, a die and a punch located within said cutting area, said punch being reciprocal

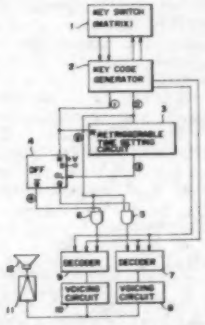


relative to said die, means for indexing said cam assemblies and means for moving said punch.

4,373,415
ELECTRONIC MUSICAL INSTRUMENT

Nobuaki Kondo, Omiya, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Mar. 17, 1980, Ser. No. 130,774
Claims priority, application Japan, Mar. 26, 1979, 54-35248
Int. Cl.³ G10H 1/36
U.S. Cl. 84—1.01 5 Claims

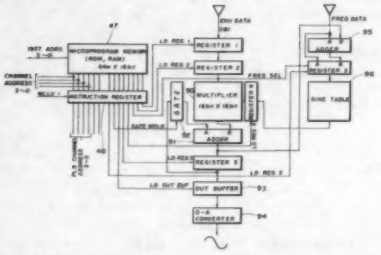


1. An electronic musical instrument comprising:
a single manual keyboard having keys;
said keyboard being provided with two voicing blocks, one of said voicing blocks producing, in response to key depression, at least one of a melody tone, an accompaniment tone, or a base tone, with the other of said blocks producing at least one of the remaining of said tones, said voicing blocks having a spatial interval of keys of the keyboard therebetween;
means for producing time-divided signals by depression of a key;
first circuit means responsive to said time-divided signals for producing a certain time interval for distinguishing between tones produced by said voicing blocks and for thereby separating in time the tones produced,
and
a second circuit means for producing monophonic and polyphonic sounds from the tones separated by said first circuit means.

4,373,416
WAVE GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENT

Akinori Endo, and Hirokazu Kato, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 865,272, Dec. 28, 1977, abandoned. This application Dec. 10, 1980, Ser. No. 214,939
Claims priority, application Japan, Dec. 29, 1976, 51-158945; Dec. 29, 1976, 51-158946; Dec. 29, 1976, 51-158947; Dec. 29, 1976, 51-158949
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 25 Claims



1. A wave generator for an electronic musical instrument, comprising: a microprogram memory for storing a set of instructions, said instructions consisting of instructions for musical tone calculation and for indicating the sequence of calculation of a plurality of sample values constituting a musical tone waveform according to a predetermined calculation formula; an instruction delivery circuit connected to said microprogram memory for delivering said instructions; a data source for generating frequency data and envelope data which respectively designate a tone pitch and a sounding timing of each tone to be produced;

an arithmetic circuit for carrying out waveform calculations under the control of said instructions; a plurality of registers connected to said data source, said instruction delivery circuit and said arithmetic circuit for storing said frequency data, said envelope data, and arithmetic intermediate results which are inputted from said arithmetic circuit during the waveform calculations; and

a function table connected to said registers for storing function values at respective addresses and delivering the function values when accessed by said registers under the control of said instructions;

said arithmetic circuit carrying out said calculations using said frequency data, said envelope data and said function values received from said registers and in accordance with said instructions received from said registers;

the calculation results constituting a musical tone wave.

22. A wave generator for an electronic musical instrument, comprising:

a segment indicating signal generator for generating, one after another in sequence, a plurality of different numerical valued segment indicating signals, the segments being timewise divisions of an envelope wave to be generated;

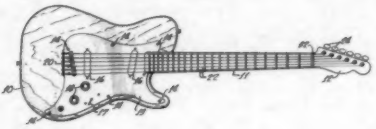
a variation rate generator for generating a plurality of different variation rate signals, each being a signal exhibiting a numerical value, said variation rate generator being connected to said segment indicating signal generator to selectively generate a variation rate signal from among said variation rate signals according to said segment indicating signals; and

a calculation circuit including an arithmetic circuit and a register and connected to said variation rate generator, for sequentially producing, by calculation using each said numerical value as a calculation increment, sample values are after another which constitute an envelope wave having wave values varying at a rate determined by the selected one of said variation rate signals for each of said segments.

4,373,417
ELECTRIC GUITAR

Gregg Wilson, Aurora, Colo., and John F. Page, La Mirada, Calif., assignors to CBS Inc., New York, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,198
Int. Cl.³ G10H *3/00;* G10D *1/08, 3/04, 3/18*
U.S. Cl. 84—1.16 10 Claims



1. An electric guitar, which comprises:

(a) a wooden body,

(b) an elongated neck extending from one end of said body, and having a head at the outer end thereof,

(c) a pickguard secured to the upper surface of said body, said pickguard being formed of sheet metal,

(d) a flange integral with a region of said pickguard remote from said neck,

said region being disposed along an imaginary extension of said neck,

said flange extending upwardly from said pickguard, said flange forming part of a bridge assembly,

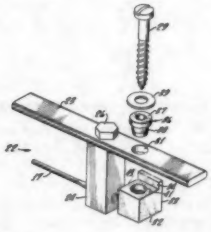
(e) a plurality of tensioned guitar strings extending from said head along said neck and across a portion of said bridge assembly, and

(f) pickup means to sense the vibrations of said strings.

4,373,418
TUNING FORK MOUNTING ASSEMBLY IN ELECTROMECHANICAL PIANOS

Harold B. Rhodes, La Habra, and Steven J. Woodyard, Stanton, both of Calif., assignors to CBS Inc., New York, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,777
Int. Cl.³ G10D *13/08;* G10H *3/00*
U.S. Cl. 84—404 15 Claims



1. In an electromechanical piano of the type in which each tone is generated by striking the low-mass leg of an asymmetrical fork, and the resulting vibrations of such leg are transduced into a voltage adapted to be amplified and used to drive a loudspeaker, an improved mounting means for each such fork, said mounting means comprising:

(a) a single screw extended through an oversize opening in a high-mass portion of said fork and thence into a support,

(b) resilient means to maintain said high-mass portion in spaced relationship from said support without effecting substantial damping of said fork,

(c) means to prevent said fork from rotating about the axis of said screw,

said means (c) being spacer or standoff means interposed between said fork and the fork adjacent thereto for contact with high-mass portions of both forks,

the single screw for each fork cooperating with the screw of the adjacent fork, and also with high-mass portions of both forks and with spacer or standoff means, to prevent rotation of each fork about the axis of its associated screw, and

(d) characterized in that said means (a) and (b) constitute the sole support for said fork, and said means (c) constitutes the sole means for preventing each fork from rotating about the axis of its associated screw.

4,373,419

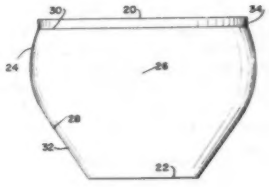
DRUM APPARATUS

Gene J. Tuttrup, 12 Vista Villa Park, Waseca, Minn. 36093

Filed Jan. 12, 1981, Ser. No. 224,428

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—411 R **25 Claims**



1. Percussion instrument apparatus comprising a drum body having a first open end and a smaller second open end opposite the first open end, the body having first and second sidewall sections, the first sidewall section comprising a truncated spherical section curving convexly and the second sidewall section comprising a truncated conical section sloping inwardly from the first sidewall section.

4,373,420

COMBUSTION SUPPRESSOR

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Oct. 6, 1980, Ser. No. 194,533

Int. Cl.³ F41F *3/04*

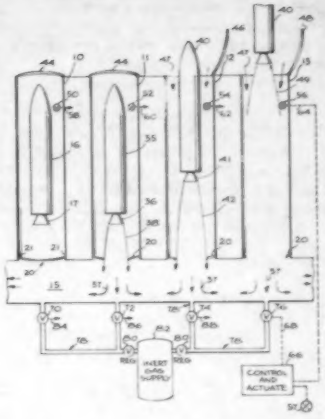
U.S. Cl. 89—1.812 **8 Claims**

7. A method of suppressing exhaust gas combustion in a multiple rocket launching system comprising a plurality of rocket launch tubes having exhaust gas exits and a plenum chamber interconnecting said exhaust gas exits and communicating with external exhaust means, said method comprising:

sensing the pressure in the launch tubes during firing of the rockets;

determining when the pressure in said launch tube falls below a preselected level; and

providing a supply of inert gas to said plenum when pressure in said launch tube falls below said preselected level in a



quantity effective to prevent ingress of combustible atmospheric gases into said plenum.

4,373,421

EMERGENCY AEROSOL LUBRICATION DEVICE, PARTICULARLY FOR AIRBORNE ENGINES

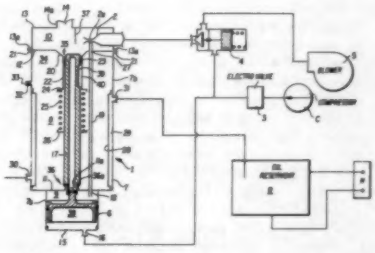
Andre A. M. L. Camboulives, Savigny sur Orge; Pierre Debeneix, Saint Sauveur sur Ecole; Claude V. L. Gendronneau, Fontainebleau, and Roger P. Huguet, Paris, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.), Paris, France

Filed Sep. 15, 1980, Ser. No. 187,069

Claims priority, application France, Sep. 17, 1979, 79 23488

Int. Cl.³ F01M *1/18*

U.S. Cl. 184—6.4 **4 Claims**



1. Emergency aerosol lubrication device, particularly for an airborne engine, comprising:

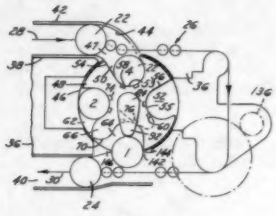
a closed reserve compartment for placing a certain quantity of oil in reserve,

means for introducing oil into said reserve compartment, with a volume of air provided at the upper end of said reserve compartment,

an aerosol container connected to lubrication points and disposed above and separated from said reserve compartment by a wall, at least a part of said wall being essentially oil-tight under low pressure so as to avoid drainage of oil out of said reserve compartment, and having a depression, at the lower point of which opens a recovery conduit for recovery of non-atomized oil, with said conduit communicating with said reserve compartment,

controllable means supplied separately with air to atomize said oil in said aerosol container,
an oil supply conduit operatively associated with said controllable means, opening into the lower part of said reserve compartment, and
means for keeping the reserve oil at an appropriate temperature.

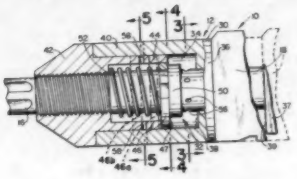
4,373,422
RECIPROCATING FEED SYSTEM
William J. Washburn, Capistrano Beach; Hugh B. Thompson, Santa Ana, and Clifford E. La Fever, Mission Viejo, all of Calif., assignors to Ford Motor Company, Dearborn, Mich.
Continuation of Ser. No. 947,283, Sep. 29, 1978, abandoned. This application Aug. 7, 1980, Ser. No. 176,222
Int. Cl.³ F41D *10/04*
U.S. Cl. 89—33 CA **8 Claims**



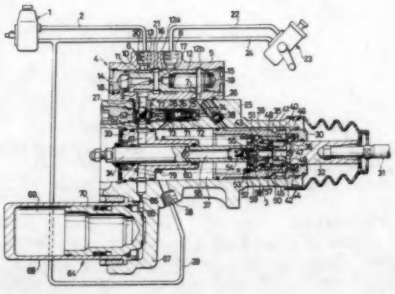
1. An article handling system comprising:
a frame member;
a work station connected to the frame member;
a conveyor means connected to the frame member for conveying articles;
means for feeding said articles from the conveyor means to the work station, the feeding means including:
a sprocket rotatably mounted about its central axis;
said sprocket having a receptacle slot at its perimeter for receiving an article from the conveyor means and a discharge slot circumferentially spaced from said receptacle slot;
a drive means for oscillating the sprocket about its central axis between a first position wherein said receptacle slot in its first position receives the articles from the conveyor means and a second position wherein said receptacle slot in its second position is in communication with the work station and the articles can pass from said receptacle slot to the work station and said discharge slot oscillates between a first position for receiving a used article from the work station and a second position for passing the used article through an outlet in the frame member;
said slots spaced about the sprocket such that the receptacle and discharge slots are in their respective first positions and second positions at simultaneous times;
an ejector cam which oscillates between two positions, the cam abuts the used article held in the discharge slot as the sprocket moves between its two positions to move the used articles radially outward from said discharge slot; and
a second drive means for oscillating the ejector cam.

4,373,423
GAS OPERATED MECHANISM HAVING AUTOMATIC PRESSURE REGULATOR
Wildey J. Moore, P.O. Box 4046, New Windsor, N.Y. 12550
Filed Jun. 2, 1980, Ser. No. 155,793
Int. Cl.³ F41D *5/08, 5/10*
U.S. Cl. 89—191 A **16 Claims**

1. In a gas operated firearm having an axially elongated barrel including a bore extending therethrough, means defining an annular gas chamber of variable volume surrounding an associated portion of the barrel and including a guide member mounted on the barrel and a first reaction member coaxially surrounding an associated portion of the barrel and supported for limited axial movement between first and second positions relative to the barrel, and means defining a gas port communicating with the bore and the gas chamber, said first reaction member being movable in one axial direction from its first to its second position in response to gas pressure within the chamber, the improvement comprising a second reaction member supported in coaxial surrounding relation to said barrel by said guide member for axial movement relative to said barrel and said first reaction member, said first and second reaction members having opposing reaction surfaces defining associated portions of said chamber, means for biasing said second reaction member in said one axial direction toward said first reaction member and to an inactive position, and means defining a vent for communicating with said chamber and the atmosphere to vent gases of explosion from said chamber, said vent means being normally out of communication with said chamber, said second reaction member being movable in opposition to said biasing means and in an axial direction opposite said one axial direction from said inactive position to another position in response to gas pressure within said gas chamber, said second reaction member being further movable in said opposite axial direction from said other position to a venting position in response to gas pressure within said chamber, said venting means being in communication with said chamber and with the atmosphere only when said second reaction member is in said venting position.



4,373,424
HYDRAULIC BOOSTER
Yoshiharu Adachi, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan
Filed Sep. 3, 1980, Ser. No. 183,641
Claims priority, application Japan, Sep. 4, 1979, 54-113812
Int. Cl.³ F01B *25/02;* F15B *9/10*
U.S. Cl. 91—20 **9 Claims**



1. A hydraulic booster, comprising:
a hydraulic pump for producing a fluid discharge pressure;
a distributor valve casing having first and second outlet ports and an inlet port for receiving pressurized fluid from said pump;

a spool valve slidably fitted in said valve casing and comprising first and second lands for controlling the flow of fluid from said inlet port to said first and second outlet ports in a predetermined manner in response to pressure variations at said first and second outlet ports and a third land for raising the discharge pressure of said pump to a level considerably higher than the pressure at said first outlet port in response to a pressure increase at said first outlet port;

a cylinder body having a first inlet port communicating with said first outlet port of said distributor valve casing, a second inlet port supplied with the discharge pressure of said pump and an outlet communicating with a reservoir;

a power piston slidably fitted in said cylinder body and defining therein a pressure chamber and a drain chamber respectively communicating with said first inlet port and outlet of said cylinder body;

a valve member slidably mounted in said power piston;

a normally open valve including said valve member and further comprising an input piston which is operated by a driver;

passage means communicating said pressure and drain chambers with each other through said normally open valve;

a normally closed valve disposed within said power piston and adapted to be opened by said input piston through said valve member when said normally open valve is completely closed;

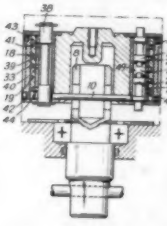
passage means communicating said second inlet port and said pressure chamber with each other through said normally closed valve; and an output rod connected to said power piston.

4,373,425

HYDRAULIC ENGINE

Georges Moatti, 17, rue Gutenberg, 92100 Boulogne sur Seine, France

Filed Jul. 1, 1980, Ser. No. 164,907
Claims priority, application France, Jul. 2, 1979, 79 17154
Int. Cl.³ F01L *21/04, 21/02, 25/02*
U.S. Cl. 91—227 **6 Claims**



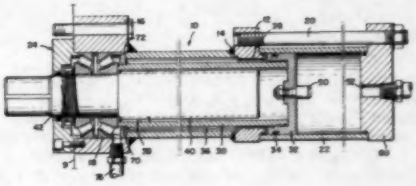
1. Hydraulic engine used in particular to drive a self-cleaning filter, which engine comprises a piston moving with an automatically controlled reciprocate motion, inside a cylinder into the walls of which issue a pressurized hydraulic fluid supply pipe and an exhaust pipe for said hydraulic fluid, said piston defining with the cylinder two chambers to receive the hydraulic fluid and comprising drive means parallel to the piston axis and sliding in said piston, said drive means ensuring the selective and successive communication of the supply pipe and exhaust pipe with each one of the chambers, via conduits provided inside the piston, said piston comprising a central core and a sleeve mounted in sealed manner on said core, said core being provided on its periphery with at least three annular grooved portions forming with the inside wall of the sleeve three annular fluid-tight grooves, the middle groove being in permanent communication with the exhaust pipe and the two adjacent grooves being in permanent communication with the supply pipe, whereas the middle groove and one of the two adjacent grooves are selectively and respectively connected with the two chambers of the cylinder via a slide valve mounted in the piston and forming part of said drive means, said valve comprising outlets respectively connected to the two chambers via conduits provided in the core of the piston and issuing on to each of the faces thereof.

4,373,426

ROTARY ACTUATOR

Paul P. Weyer, c/o Weyer Machine Co. Inc., 1462 Blake St., Enumclaw, Wash. 98022

Division of Ser. No. 960,043, Nov. 13, 1978, abandoned. This application Nov. 3, 1980, Ser. No. 203,156
Int. Cl.³ F15B *15/22*; F01B *3/00*
U.S. Cl. 91—396 **5 Claims**



1. A helical rotary actuator comprising a cylindrical torque transmitting first section surrounding a linear-to-rotary force transmission chamber and a cylindrical second section, a base adapted to be secured to a support surface, said torque transmitting first section being rigidly secured to said base for transmitting reaction torque thereto, a separate, independent ring gear having teeth projecting radially inward of said torque transmitting first section into said chamber, and weld means integrally connecting said first section to said ring gear for transmitting torque between said ring gear and said first section,

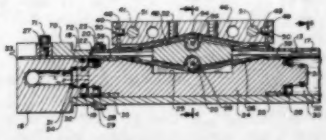
said base including a bearing section having a bearing, a rotary output shaft in said bearing, piston means reciprocably mounted within one of said sections and helical spline means within said chamber drivingly interconnected to said ring gear, piston means and rotary output shaft for rotating said output shaft in response to reciprocation of said piston means.

4,373,427

FLUID PRESSURE CYLINDER

Venkat R. Garlapaty, Plymouth; Michael J. Hall, and William C. Branham, both of Wayzata, all of Minn., assignors to Tol-O-Matic, Inc., Minneapolis, Minn.

Filed Jan. 31, 1980, Ser. No. 117,347
Int. Cl.³ F01B *29/08*
U.S. Cl. 92—88 **25 Claims**



1. A fluid power cylinder comprising:

an elongated cylinder having a pair of pressure fluid chambers and an elongated slot of predetermined width extending generally parallel to the longitudinal axis of said cylinder, said cylinder further including a first pair of beveled cylinder edges joining the sides of said slot with the inner surface of said cylinder;

a piston reciprocally movable within said cylinder in re-

sponse to the introduction of fluid pressure in said pressure fluid chambers; and

an elongated inner strip seal member of greater width than said slot, said inner seal member including a laminated structure comprising a first layer of thin, non-elastic but flexible material and a second layer of magnetic material, said first and second layers being secured to one another, said inner seal member further having top and bottom generally flat surfaces parallel to one another and a first pair of beveled seal member edges for cooperating engagement with said first pair of beveled cylinder edges for successively sealing said slot during movement of said piston.

4,373,428

GLIDE SHOE OF A HYDRAULIC PISTON MACHINE

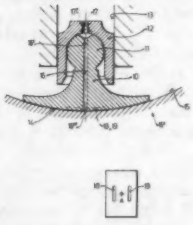
Hans J. Fricke, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 936,603, Aug. 23, 1978, abandoned. This application Dec. 22, 1980, Ser. No. 219,385

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750490

Int. Cl.³ F01B *31/10*

U.S. Cl. 92—159 **16 Claims**



1. In a hydraulic piston machine of the type having a housing, a reciprocable piston in the housing, and a piston-reciprocating element having a glide surface and operating for reciprocating the piston, a combination comprising a glide shoe articulately connected to said piston and moving relative to the piston-reciprocating element in a first direction, said glide shoe having a glide face in sliding contact with said glide surface of the piston-reciprocating element, said glide shoe having at least one bore communicating with an interior of said housing and extending toward said glide face so that a working medium which flows through said bore causes build-up of a hydrostatic pressure between said bore and said glide surface of said piston-reciprocating element, said glide face being continuous and being interrupted only by recess means which occupies not more than a relatively small portion of said glide face and consists of an outlet of said bore which opens at said glide face of said glide shoe and, at least one groove which extends on said glide face of said glide shoe only in said first direction and is narrow in a second direction which is transverse to said first direction, so that the width of said groove measured in said second direction is considerably smaller than the length of the same measured in said first direction and no grooves extending in a direction other than said first direction are provided on said glide face, whereby a relatively high hydrodynamic pressure can build up between the remainder portion of said glide face of said glide shoe and said glide surface of said piston-reciprocating element during working movement of said glide shoe relative to the piston-reciprocating element.

4,373,429

STEAM SEALING STRIP FOR WATER BAKING PLATES

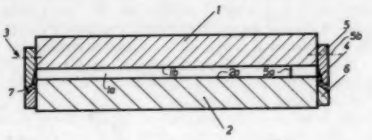
Franz Haas, Sr., Gerstigasse 25, 1210 Wien; Franz Haas, Jr., Castellezgasse 32, 1020 Wien, and Johann Haas, Wiener Strasse 209-215, 2104 Spillern (NÖ), all of Austria

Filed Feb. 27, 1981, Ser. No. 238,679

Claims priority, application Austria, Feb. 27, 1980, 1086/80

Int. Cl.³ A47J *37/01*

U.S. Cl. 99—375 **18 Claims**



1. A steam sealing strip for closing open edges between opposed upper and lower cooperating wafer baking plates having opposed primary wafer baking surfaces spaced apart by a certain height, the primary wafer baking surfaces defining a primary wafer baking space between the wafer baking plates, the primary wafer baking space being for the baking of dough, the height between plates also being the height of the primary wafer baking space, which height does not include the depth of any engraving in the primary baking surfaces, the sealing strip comprising:

an upper sealing strip portion for coupling with the upper baking plate;

a lower sealing strip portion for coupling with the lower baking plate;

said upper sealing strip portion having a secondary baking surface facing said lower sealing strip portion;

said lower sealing strip portion having a secondary baking surface facing said upper sealing strip portion, said secondary baking surfaces of said upper and lower sealing strip portions being in opposed, spaced, face-to-face relationship and defining a gap therebetween;

a secondary baking space between said opposed surfaces of said sealing strip portions for receiving excess dough from between the baking plates and for baking the excess dough to prevent the formation of unbaked dough portions, said secondary baking space being defined by said gap between said secondary baking surfaces of said sealing strip portions; and

a plurality of steam channels in at least one of said sealing strip portions for releasing steam from between the wafer baking plates, said steam channels opening into said secondary baking space.

4,373,430

HUMIDIFIER FOR A PROOF BOX

Beverly J. Allen, Seattle, Wash., assignor to Oscar Lucks Company, Seattle, Wash.

Filed Oct. 2, 1978, Ser. No. 947,438

Int. Cl.³ H05B *1/00*; A21C *13/00*

U.S. Cl. 99—468 **10 Claims**

1. A fast warmup, high capacity humidifier for a proof box comprising:

(a) a heater pan means including:

(i) a heater pan having a base, a peripheral sidewall entending upwardly therefrom wherein said heater pan is adaped to receive and hold a shallow pool of water, and

(ii) an electric heating element means for heating at least substantially the entire said base to a temperature sufficient to vigorously boil at least substantially the entire said shallow pool of water to quickly produce large volumes of steam to quickly humidify the interior of said proof box during operation of the humidifier;

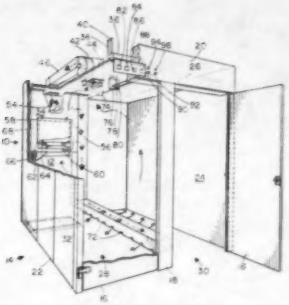
(b) a water supply means adapted for maintaining said shal-

low pool of water at a preselected depth during operation of the humidifier;

(c) a water supply conduit means adapted for conveying water from said water supply means to the interior of said heater pan means;

(d) support means for supporting said heater pan means for selective rotation about a horizontal axis;

(e) swivel coupling means located in said water supply con-



duit means between said water supply means and said heater pan means; and

(f) a drip pan removably mounted to said support means beneath said heater pan;

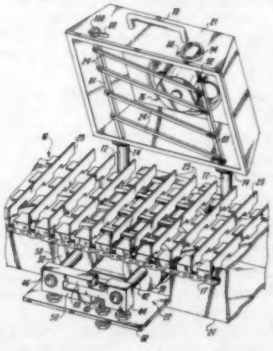
wherein when it is desired to empty said heater pan means, such as for cleaning, said heater pan means may be rotated on said support means to dump the contents thereof into said drip pan, without the necessity of disconnecting said water supply conduit means.

4,373,431

APPARATUS FOR APPLYING A GRILL STRIPE TO A MEAT PRODUCT

William P. Wallick, 7478 W. 10th Ave., Lakewood, Colo. 80215, and George A. Gauthier, Arvada, Colo., assignors to William P. Wallick, Lakewood, Colo.

Filed Dec. 8, 1980, Ser. No. 214,187
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—483 **23 Claims**



1. An apparatus for placing at least one grill stripe on a tubular meat product of circlar transverse cross section, said apparatus operably connected to a meat product conveyor so as to receive individual tubular meat products from said meat product conveyor, which meat product conveyor conveys said tubular meat products at incremental spaces along a predetermined path comprising, in combination:

means for scoring at least one grill stripe around the circumference of said meat product; and

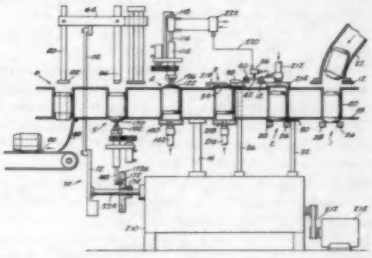
means for placing said meat product into contact with said means for scoring said grill stripe, said means for placing said meat product into contact receives said meat product from said meat conveyor and moves said meat product translationally and rotationally along said means for scoring a grill stripe over a predetermined distance along said meat product conveyor.

4,373,432

TOP AND BUTT TRIMMER FOR PINEAPPLES

Masato Tsutsumi, Kahului, Hi., assignor to Maui Land & Pineapple Company, Inc., Kahului, Hi.

Filed Jul. 21, 1978, Ser. No. 927,132
Int. Cl.³ A23N *3/00, 4/20, 7/08*
U.S. Cl. 99—542 **7 Claims**



1. An improved Ginaca machine for the automatic processing of pineapples, comprising:

a turrent rotatable about a vertical axis, said turret having at least six barrels therein;

means for rotatably driving and indexing said turret whereby the barrels are temporarily and sequentially indexed at a plurality of processing stations;

feed means at the first of said stations for continuously introducing cylindrically pre-sized, partially skinned pineapples into a barrel of said turret;

first cutting means at the second of said stations for cutting an end of a pineapple, said means including a continuously rotating knife blade positioned adjacent a horizontal surface of said turret and moving parallel thereto, adjustable gauging means adjacent said turret at said station, and means for moving a pineapple cylinder in a barrel into contact with said gauging means;

second cutting means at the third of said stations for cutting the other end of a pineapple, said means including a continuously rotating knife blade positioned adjacent the opposite horizontal surface of said turret and moving parallel thereto, adjustable gauging means adjacent said turret at said station, and means for moving a pineapple cylinder in a barrel into contact with said gauging means;

first trimming means at the fourth of said stations for trimming remaining shell and blemishes from the corners of an end of a pineapple cylinder, said trimming means comprising a stationary trimming knife assembly including a rotating knife blade, and means for moving the pineapple cylinder in its barrel to engage said knife assembly;

second trimming means at the fifth of said stations for trimming remaining shell and blemishes from the corners of the other end of a pineapple cylinder, said second trimming means comprising a stationary trimming knife assembly including a rotating knife blade, means for coring said pineapple cylinder, and means for moving the same into engagement with said trimming knife assembly; and

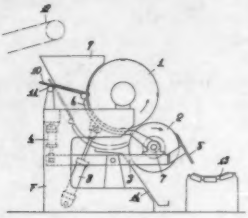
means at the sixth of said stations for ejecting pineapple cylinders from the turret.

4,373,433

METHOD AND APPARATUS FOR DEWATERING SCREENINGS

Shigeki Kamei; Masamori Fushio, and Atuo Hirai, all of Amagasaki, Japan, assignors to Hitachi Kiden Kogyo, Ltd., Hyogo, Japan

Filed Jan. 26, 1981, Ser. No. 228,701
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—37 **5 Claims**



1. A method of dewatering screenings comprising the steps of: a preliminary dewatering by pushing a movable chute on which screenings are supplied against the outer circumferential surface of an upper dewatering roller and a secondary dewatering by compressing the preliminarily dewatered screenings between an upper dewatering roller and a lower dewatering roller which is arranged in such a position that it is backward at a certain angle in relation to the vertical line passing the center of the axis of the upper dewatering roller, both rollers being turned in the direction of catching screenings therebetween.

4,373,434

APPARATUS FOR THE EXPANSION OF OIL BEARING SEEDS

David G. Alexander, and Ian J. Woolley, both of Hull, England, assignors to Simon-Rosedowns Limited, Hull, England

Filed Nov. 24, 1980, Ser. No. 209,690
Int. Cl.³ B30B *9/18, 11/24*
U.S. Cl. 100—43 **7 Claims**

1. Apparatus for the expansion of oil bearing seeds of the kind comprising at least one screw rotatable in a barrel for conveying seed through the barrel from one end to the other, a die plate having orifices therein at the output end of the barrel and through which the seed material is extruded by the action of the screw or screws, a plurality of needles aligned with at least some of said orifices outside of said barrel and movable relative to the die plate thus to be inserted into the associated orifices at least partially to occlude same to enable the effective area of cross-section thereof to be varied.

4,373,435

CRUSHER AND SEPARATOR FOR CANS AND BOTTLES

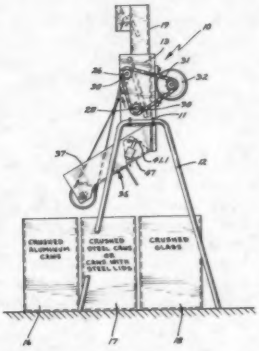
John J. Grevich, Rte. 1, Box 34, Star Prairie, Wis. 54026

Filed Jan. 5, 1981, Ser. No. 222,666
Int. Cl.³ B30B *9/32*
U.S. Cl. 100—49 **13 Claims**

1. A crusher and separator for metal and glass containers, comprising

a crushing means for mashing such containers into scrap by reducing metal cans into flattened condition and glass bottles into small particles,

an inclined discharge chute below the crushing means receiving the scrap from the crushing means and having a bottom wall with a lower end and a revolving separating wheel at the lower end of the bottom wall, the wheel revolving on a horizontal axis below the bottom wall and transverse to the chute and the wheel having a portion of its periphery protruding upwardly of the lower end of the bottom wall to obstruct smooth sliding of the flattened cans down and off the chute and causing the flattened cans to hesitate, the wheel having a magnet on its periphery to adhere flattened steel cans thereto, the wheel propelling flattened aluminum cans from the chute, the bottom wall of the inclined chute having a glass discharging port therein directly below the crushing means and spaced along the chute above the lower end thereof, the wheel



having upper and lower portions of its periphery, the chute being adjacent the upper portion of the periphery for delivering flattened cans thereto, there being open and unobstructed space adjacent the lower portion of the periphery of the wheel to permit all flattened cans to move downward adjacent the lower portion of the periphery of the wheel,

a deflector beneath the lower end of the bottom wall and adjacent the periphery of the separating wheel to knock the steel cans off the revolving wheel and magnet, the steel cans dropping at a location spaced from the discharging of the aluminum cans,

and a movable gate traversing the glass discharging port and allowing crushed cans to slide thereover to the separating wheel, the gate being movable to open the port and permit glass particles to fall through at a location spaced from the dropping of the steel cans.

4,373,436

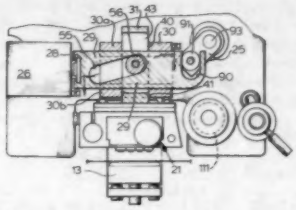
AXIALLY ALIGNED DRIVING CAM IMPRINTER

James L. Shenoha, Lockport, Ill., assignor to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Filed Jun. 11, 1980, Ser. No. 158,632
Int. Cl.³ B41F *31/16, 1/00*
U.S. Cl. 101—27 **4 Claims**

1. In an intermittent imprint marker including base means, a reciprocatably movable marker head block, an opposed anvil, tape supply and take-up reels, a power member moved cam slot member having a first cam slot for driving a follower operably affixed to the head block, and a second cam for driving a tape advance drive roller, the improvement of a projecting shaft on the head block, a slot opening extending through the shaft spaced from the head block, the cam slot member projecting through the slot opening normal to the direction of reciprocal movement of the head block, the first cam slot

aligned with the slot opening, a cam follower affixed to the shaft positioned in the first cam slot, the second cam being spaced from the first cam slot, and bearing means supporting the cam slot member, said bearing means including a bearing member having spaced parallel legs with opposed grooves



therein and aligned openings therethrough, said shaft extending through the aligned openings and restrained against lateral movement thereby, the cam slot member received in the opposed grooves and retained against non-linear movement thereby, the slot opening and cam slot member cooperating to prevent rotation of the shaft.

4,373,437

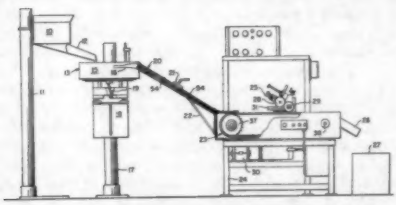
APPARATUS TO SUPPLY ARTICLES FOR PRINTING

Ralph L. Rodenbaugh, Pittsburgh, and John M. Zwigert, Cabot, both of Pa., assignors to Deco Coatings Corporation, Pittsburgh and Carl Strutz & Company, Inc., Mars, both of, Pa.

Filed Dec. 19, 1980, Ser. No. 218,417

Int. Cl.³ B41F *17/00*

U.S. Cl. 101—35 **10 Claims**



1. Apparatus to supply articles in succession to a printing station, said apparatus including a conveyor having spaced-apart attachment members extending from the top of pivotally-joined links engageable with a support for movement from an article-loading station to beyond said printing station, a drive coupled to at least one of two sprockets engaging the links at opposite ends of the conveyor, a supply chute inclined at an acute angle to the horizontal and including an article guide extending to said loading station, an article-constraining member with a yieldable end section extending from said article guide beyond the terminal end thereof and over the initial part of said conveyor for restraining an article against advancement from the article-loading station, said yieldable end section being normally spaced from the top of an attachment member while located at the loading station by a distance less than the height of the articles in the supply chute for restraining an article against advancement from the loading station toward the printing station until an underlying attachment advances to engage the article whereupon the yieldable end section permits falling of the article onto the conveyor between attachments for advancement of the article to the printing station, means to deliver a succession of abutting articles to said supply chute, and printing means at said printing station operative in a timed relation with movement of said conveyor to print indicia upon the articles when carried by said conveyor.

4,373,438

DOT PRINTER

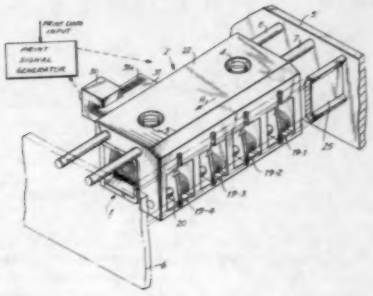
Kenichiro Arai, Shiojiri, Japan, assignor to Shinshu Seiki Kabushiki Kaisha, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Dec. 24, 1980, Ser. No. 219,741

Claims priority, application Japan, Dec. 28, 1979, 54-172230

Int. Cl.³ B41J *3/12*

U.S. Cl. 101—93.04 **17 Claims**



1. A dot printer for printing on a recording media using a matrix of dots comprising:

a carriage, said carriage being supported for reciprocal motion in a lateral direction;

at least one printing lever, each printing lever including a printing surface for impacting said medium for printing, and a bearing surface, said at least one printing lever being pivotably mounted and connected to said carriage for lateral movement therewith;

electromagnetic means associated with each said at least one printing lever, each said electromagnetic means including a movable plunger, a wire connected at one end to said plunger for movement therewith, the other end of said wire engaging said bearing surface of said printing lever, a coil frame having a coil core and a coil mounted thereon, energization of said electromagnetic means causing said movable plunger to be attracted to said coil core, said printing means pivoting and impacting said printing surface against said printing medium, said electromagnetic means being mounted on said carriage and moving therewith;

individual spring means associated with each said at least one printing lever, one end of said spring means being connected to said carriage, the other end of each said spring means being connected to one of said at least one printing levers and biasing said printing lever in a position away from said recording medium,

said wire operating in opposition to said spring means when said electromagnetic means is energized, printing of said medium being done at a plurality of lateral positions.

4,373,439

CHARACTER RING-SELECTING TYPE PRINTER

Hitoshi Mikoshiba, Shiojiri, Japan, assignor to Shinshu Seiki Kabushiki Kaisha, Nagano and Kabushki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Dec. 16, 1980, Ser. No. 216,900

Claims priority, application Japan, Dec. 17, 1979, 54-163692

Int. Cl.³ B41J *9/12*

U.S. Cl. 101—93.09 **9 Claims**

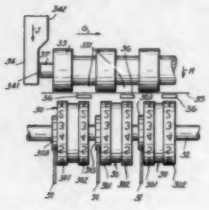
1. A character ring selecting type printer for printing on a print media, comprising:

a plurality of character rings mounted for rotation, each said character ring having at least two character columns on the periphery thereof, said columns being laterally separated;

means for rotating said character rings;

individual means for stopping each said character ring in any selected rotational position;

pressing means for simultaneously pressing against each said character ring for printing while said character rings are stopped, said pressing means always operating simultaneously, when pressing, said pressing means pressing only a first one of said at least two character columns on each said character ring at any one time;



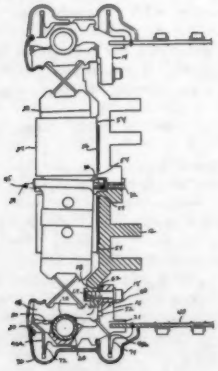
means for laterally translating said pressing means from a position in which each pressing means is positioned adjacent one character column on a character ring to a position in which each pressing means is adjacent another character column of the same character ring, said translated pressing means when pressing, always simultaneously pressing for printing only said another one of said at least two character columns on each said character ring.

4,373,440

HAMMER BANK ASSEMBLY

Val K. Jezbera, 642 Encino Vista Dr., Thousand Oaks, Calif. 91360

Filed Aug. 13, 1979, Ser. No. 65,766
Int. Cl.³ B41J *9/30*
U.S. Cl. 101—93.34 **21 Claims**



1. A hammer bank mounting assembly for accurately mounting a plurality of print hammers of the type having an impact tip and a flat coil section supported by a pair of crossed spring wires which extend through a foot member, comprising:

an elongated metal frame having a planar frontal region to which a plurality of spaced parallel magnets can be attached, a bottom planar edge which is accurately spaced and aligned with respect to said frontal region, and a rear mounting plane which is accurately spaced and aligned with respect to said frontal region;

an elongated first shoe member having a generally L-shaped cross section including an upwardly extending arm attached to said frame, said arm including a mounting plane which is accurately spaced and aligned with respect to said rear mounting plane, and a generally horizontal section which projects forwardly from said frame below said bottom edge, said horizontal section having a channel extending along the length thereof; and

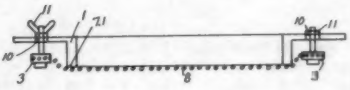
a rigid elongated rod extending along the length of the channel, said rod being accurately spaced and aligned with respect to the mounting plane of the arm of said shoe member, the foot members of said print hammers being securable to said assembly parallel to one another and perpendicular to said rod and in contact with said rod and said bottom edge to achieve accurate alignment of said hammers.

4,373,441

HEATABLE SIEVE FOR SCREEN PRINTING

Elmar Messerschmitt, Paul-Hösch-Str. 13, 8000 München 60, Fed. Rep. of Germany

PCT No. PCT/EP80/00023, § 371 Date Dec. 23, 1980, § 102(e) Date Dec. 12, 1980, PCT Pub. No. WO80/02257, PCT Pub. Date Oct. 30, 1980
PCT Filed Apr. 23, 1980, Ser. No. 227,072
Int. Cl.³ B05C *17/06, 17/08*
U.S. Cl. 101—127.1 **7 Claims**



1. A screen printing assembly for use with thermoplastic inks comprising a supporting frame having opposite frame rail portions, thermoplastic synthetic resin material on said frame rail portions, a printing screen of electrically conducting material which can be heated by transmitting electrical current therethrough, said screen having relatively low-resistance opposite portions of increased conducting cross-sectional area overlying, in contact with, and thermoplastically secured on said synthetic resin material, the remainder of the screen between said low-resistance portions being of higher resistivity and being spaced from said resin material, and respective terminal means on said low-resistance portions for connecting a source of electrical current to said screen to heat the screen, whereby to cause the screen portion between the low-resistance portions to be heated to a working temperature responsive to the connection of a source of current to said terminal means, while said low-resistance portions thermoplastically secured on said synthetic resin material are heated to a lower temperature and are relatively cool so as to prevent melting of the resin material, and wherein said low-resistance portions comprise metallic plating on the screen.

4,373,442

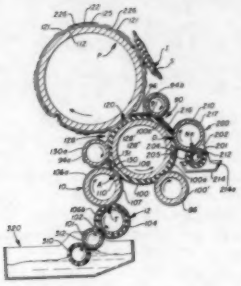
PORTABLE INK FOUNTAIN

Harold P. Dahlgren, 4008 Buena Vista, Dallas, Tex. 75205; William A. Sullivan, 3821 Grand Teton Crt., Irving, Tex. 75062; John W. Gardiner, 3028 White Oak La., Bedford, Tex. 76021, and James E. Taylor, 4129 Drowsy La., Dallas, Tex. 75233

Filed Nov. 3, 1980, Ser. No. 203,662
Claims priority, application PCT Int'l Appl., Nov. 5, 1979, PCT/US79/00947
Int. Cl.³ B41F *31/06, 31/12, 31/32, 7/26*
U.S. Cl. 101—207 **4 Claims**

1. A method of metering ink which is to be applied by a roller apparatus to a printing plate wherein the roller apparatus is rotated such that its surface speed is substantially equal to the surface speed of the printing plate, the improvement comprising: positioning a metering roller, which is positively driven by a variable speed drive, in pressure indented relation with the

roller apparatus to form an ink metering nip; supplying ink from first and second rollers to the ink metering nip; rotating said first and second rollers by frictional force from said metering roller such that adjacent surfaces move in the same direction to form a film of ink on the metering roller; positioning the



metering roller in pressure indented relation with the roller apparatus; and rotating the ink metering roller such that the surface speed thereof is less than the surface speed of the roller apparatus, said roller apparatus including at least one transfer roller which is frictionally driven at a surface speed which is greater than the surface speed of the metering roller.

4,373,443

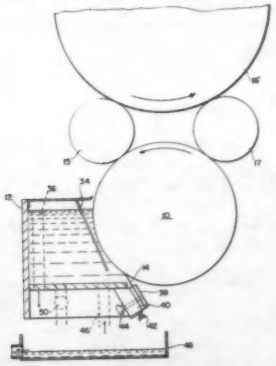
METHOD OF HIGH VISCOSITY INKING IN ROTARY NEWSPAPER PRESSES

Harshad D. Matalia, Easton, Pa., and Menashe Navi, New York, N.Y., assignors to American Newspaper Publishers Association, Easton, Pa.

Continuation of Ser. No. 122,105, Feb. 15, 1980, abandoned. This application Nov. 18, 1981, Ser. No. 322,603

Int. Cl.³ B41F *31/04, 31/06, 31/26*

U.S. Cl. 101—221 **1 Claim**



1. Method of enhancing high viscosity inking in a rotary newspaper letterpress system of the type applying high viscosity ink to both sides of the web with dual inking components, each component having an ink reservoir with an inking cylinder rotably positioned therein, two form rollers rotatably contacting said inking cylinder, a plate cylinder independently contacting said form rollers and an impression cylinder contacting one side of a moving newspaper web against the plate cylinder comprising:

A. Defining a plurality of ink repository cells conformed as truncated pyramids within the surface of each inking cylinder such that there are 200–360 cells per linear inch;

B. Immersing said repository cells by rotating each said inking cylinder within its ink reservoir where the ink has a hydrocarbon base and a viscosity in the range 2,000–2,500 centipoises;

C. Reverse angle scraping of excess ink from the surface of each said inking cylinder;

D. Further rotating each inking cylinder and repository cells against the surfaces of each pair of form rollers and rotating said form rollers against each plate cylinder;

E. Printing by rotating said plate cylinders against both sides of a newspaper web moving over the surface of a rotating impression cylinder such that the speed of rotating said inking cylinder, plate cylinder and impression cylinder is at speed of printing up to 3,000 lineal feet per minute; and

F. Sequentially immersing each inking cylinder within each said reservoir.

4,373,444

LABEL WEB OVER-PRINTER

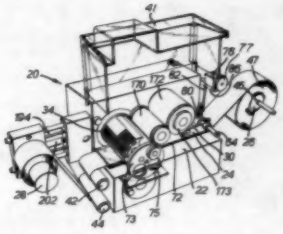
Harry Cunnington, Boston, England, assignor to Norcros Investments Limited, Reading, England

Filed Oct. 27, 1980, Ser. No. 201,275

Claims priority, application United Kingdom, Oct. 31, 1979, 7937804

Int. Cl.³ B41F *5/00, 13/04*

U.S. Cl. 101—228 **1 Claim**



1. In a label over-printer

a label web reel holder,

a frame of the over-printer mounting the reel holder,

guide means for guiding the label web from the reel,

said guide means being adjustable and adjacent one edge of the web,

a releasable brake pad operative on the upper face of the label web as it is drawn from the reel through the guide means,

a printing mechanism downstream of the guide means including

a rotary type drum having extruded groups of rails for receiving printing indicia accommodated in at least one axially extending recess in the periphery of the drum,

a rotary platen freely-rotatable and co-operating with the type drum,

means eccentrically mounting the platen whereby printing pressure between the type drum and the platen can be adjusted,

cam means secured for rotation and co-axial with the type drum,

further cam means synchronously driven in the opposite sense of the cam means of the type drum and arranged to co-operate therewith to index the web intermittently through the printing mechanism, and

an ink roller co-operating with said printing indicia, said roller incorporating

a multiplicity of discs of ink-absorbent paper arranged as a stack, and means at each end of the stack clamping the discs together,

reciprocating indexing means for providing fine adjust-

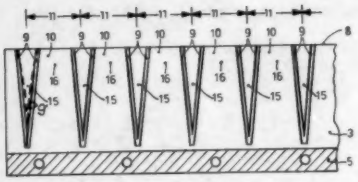
ment of the indexing stroke of the label web through the over-printer,
guide rollers operable on the printed web of labels after the printing mechanism,
a web take-up reel mounted on the frame after the said guide rollers, and
means for positively driving said take-up reel to wind the printed web on the reel.

4,373,445

DOCTOR BLADE CONSTRUCTION FOR PRINTING MACHINE

Ingo Köbler, Gessertshausen, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 268,095
Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020306
Int. Cl.³ B41F *31/04*
U.S. Cl. 101—365 **7 Claims**



1. Elongated doctor blade for use in the inking system of a printing machine having
a clamping zone (4) extending in the direction of elongation of the doctor blade and at an extremity along the length of the doctor blade;
a working zone, projecting transversely to the direction of elongation of the doctor blade and extending from the clamping zone (4) and terminating in a working edge at said other extremity of the doctor blade;
and grooves (9) formed on the surface of the doctor blade starting at the working edge, and extending towards the clamping zone and subdividing the blade into a plurality of individually positionable interconnecting zones, each of which can be individually adjusted with respect to an ink duct roller (2) of the printing machine
wherein, in accordance with the invention,
the plurality of grooves (9) are arranged in pairs, the two grooves of each pair separating the zones (10) from each other and extending, in addition to the direction from the working edge (8) towards said clamping zone, at an inclination towards each other to converge in V-formation and merging into each other at the apex of the V with the open part of the V formation located at the working edge and the apex thereof spaced from the working edge towards the clamping zone.

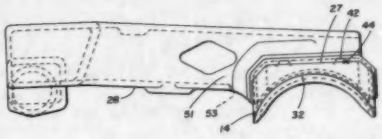
4,373,446

BEARING ADAPTER FOR RAILROAD TRUCKS HAVING STEERING ARMS

Geoffrey W. Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 28, 1980, Ser. No. 172,895
Int. Cl.³ B61F *3/08, 5/30, 5/38, 5/50*
U.S. Cl. 105—224.1 **5 Claims**

1. In a truck for a railway vehicle, a set of wheels and an axle rigidly joining said wheels, bearing assembly at each end of said axle, a first side frame having pedestal jaws accommodating therebetween one of said bearing assemblies, a second side frame having pedestal jaws accommodating the other bearing therebetween, said bearing assemblies each including a bearing adapter member and a steering arm for radially steering said truck operatively connected to said axle wherein said adapter member includes a main body portion underlying the roof of said pedestal jaws of said side frame and an extension section extending axially inward from said main body portion toward



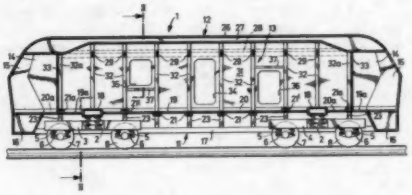
the center of said truck parallel to said axle and having an upwardly facing generally planar surface underlying said steering arm, and means maintained in compression for connecting said steering arm to said surface whereby the arm is supported on the surface.

4,373,447

RAIL VEHICLE PASSENGER BODY

Johann K. Pfister, Dietlikon, Switzerland, assignor to Schweizerische Lokomotiv und Maschinenfabrik, Winterthur, Switzerland

Continuation of Ser. No. 832,898, Sep. 13, 1977, abandoned. This application Dec. 21, 1979, Ser. No. 105,867
Claims priority, application Switzerland, Sep. 16, 1976, 11730/76
Int. Cl.³ B61D *1/00, 17/10, 17/12*
U.S. Cl. 105—399 **11 Claims**



1. A rail drive vehicle body comprising
a base;
a roof having a plate covering the whole of the vehicle body;
at least one load-bearing frame secured to and between said base and said roof, said bearing frame being disposed within the middle third of the rail vehicle body width and extending longitudinally of the body, said base, roof and bearing frame defining a unitary load bearing section member;
a plurality of transversely disposed longitudinally spaced horizontal expansion plates connected to and between respective edges of said roof plate and said bearing frame; and
a pair of mounted side walls disposed between said base and said roof longitudinally of the rail vehicle body.

9. A rail drive vehicle body comprising
a base extending over the width of the vehicle body;
a roof having a curved plate with depending longitudinal edges covering the whole of the vehicle body;
at least one load-bearing frame secured to and between said base and said roof, said bearing frame being disposed within the middle of the rail vehicle body width and extending lontidudinally of the body;
a plurality of transversely disposed longitudinally spaced horizontal expansion plates connected to and between respective edges of said roof plate and said bearing frame;
said base, roof, bearing frame and plates defining a unitary

load bearing section of generally I-shaped cross-section; and

a pair of mounted side walls disposed between said base and said roof longitudinally of the rail vehicle body.

10. A rail drive vehicle body comprising

a base extending across the width of the vehicle body;

a roof having a plate covering the whole of the vehicle body;

at least one load-bearing frame secured to and between said base and said roof, said bearing frame being disposed within the middle third of the rail vehicle body width and extending longitudinally of the body,

said base, roof and bearing frame defining a unitary bearing section member;

a plurality of transversely disposed longitudinally spaced horizontal stiffening plates connected to and between respective edges of said roof plate and said bearing frame, said plates being vertically rigid and stiff, and resilient lengthwise to the vehicle body whereby the entire roof is operative as a bearing element; and

side walls removably mounted between said base and said roof longitudinally of the rail vehicle body.

4,373,448

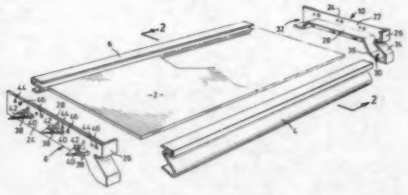
SHELF ASSEMBLY AND BRACKET THEREFOR

Frank Pallotta, Mississauga, Canada, assignor to DSH, Concord, Canada

Filed Feb. 20, 1981, Ser. No. 236,328

Int. Cl.³ A47B 41/04

U.S. Cl. 108—29 **6 Claims**



1. A combined shelf and hanger bar system for a closet comprising a planar shelf panel, a rear shelf rail the same length as the panel and engageable therewith to receive and support the rear edge of the panel, the rear shelf rail having a cross section having an upper portion receiving the rear edge of the panel and a reinforcing depending portion, a front shelf rail the same length as the panel and engageable therewith to receive and support the front edge of the panel, the front rail having a section including an upper portion engaging a front edge of the panel and a depending portion having an upturned flange for supporting garment hangers, and a pair of unitary moulded end brackets each having a wall plate having a wall engaging surface extending perpendicular to the shelf and to the rails and means to enable its attachment to a wall, and a flange extending perpendicularly from its opposite surface and having a horizontal centre portion forming an upwardly open ledge, engageable with the underside of one end of the shelf panel, and end portions defining a deep front upwardly open pocket and a shallow rear upwardly open pocket each extending downwardly relative to the ledge and engageable with the ends of the depending portions of the front and rear rails respectively.

4,373,449

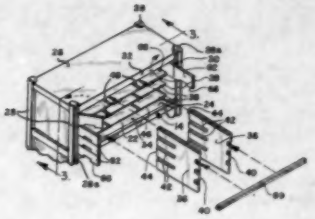
LITERATURE SHELVING

Gerald R. Klaus, St. Charles, and Thomas E. Williams, Schaumburg, both of Ill., assignors to Fellowes Manufacturing, Itasca, Ill.

Continuation-in-part of Ser. No. 111,709, Jan. 14, 1980, abandoned. This application Jun. 16, 1980, Ser. No. 159,458

Int. Cl.³ A47B 57/00

U.S. Cl. 108—60 **12 Claims**



1. A multiple-partitioned shelf unit comprising:

a rigid shelf having a shelf open end comprising a four-sided, substantially horizontal floor, a four-sided, substantially horizontal ceiling, and means supporting said ceiling above said floor, said means including two spaced-apart upstanding members defining therebetween the horizontal extent of said shelf open end, wherein said ceiling further includes a downwardly-extending lip, the free end of said lip and floor defining therebetween the vertical extent of said shelf open end;

a fiberboard shell having an upstanding rear panel hingedly connected to two upstanding side panels opposite free ends of said side panels, said shell being positioned within said shelf with said rear panel rearward of said shell open end and said free ends of said side panels each disposed at opposite ends of said horizontal extent of said shelf open end, each adjacent and inward of one of said upstanding members, and at least a portion of each of said side panels extending behind said lip; and

means forming fiberboard compartments open to said shelf open end wherein said compartment-forming means extend between said side panels and, together with said adjacent upstanding member, said lip and side rear panel, hold said side panels in a stationary upright position.

4,373,450

DISKETTE SAFE

Norman Miller, and John F. McKinnis, Jr., both of Lafayette, Ind., assignors to Schwab Safe Co., Inc., Lafayette, Ind.

Filed Nov. 24, 1980, Ser. No. 209,422

Int. Cl.³ E06B 7/16

U.S. Cl. 109—75 **9 Claims**

1. A safe for protecting the contents against high temperature and humidity comprising:

a cabinet having an interior storage space and a door opening;

a layer of insulation lining said storage space;

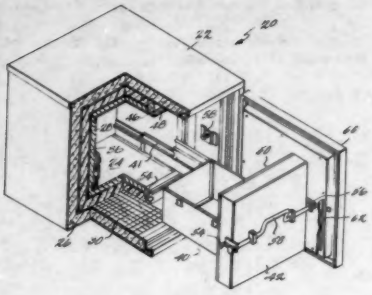
a layer of wax within said insulation layer for melting to absorb heat energy;

a drawer for holding said contents;

means for mounting said drawer for sliding movement in and out of said storage space through said door opening;

an inner door means mounted on said drawer for providing an inner seal in said door opening when said drawer is in said storage space;

means for locking said inner door means in sealing relation in said door space; and

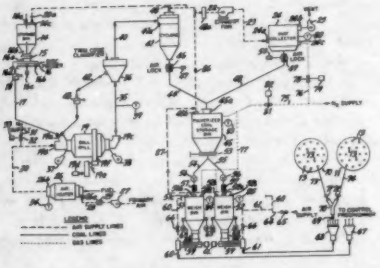


a hinged outer door for providing an outer seal of said door space.

4,373,451
APPARATUS AND METHOD FOR FEEDING PULVERIZED SOLID FUEL TO A BURNER

Kenneth L. Gardner, Riverside; Edward Gootzait, Lewisburg; Edward T. Maciejewski, Catawissa, and Donald L. Fisher, Milton, all of Pa., assignors to Kennedy Van Saun Corporation, Danville, Pa.

Filed Apr. 6, 1981, Ser. No. 251,498
Int. Cl.³ F23K *3/00*
U.S. Cl. 110—101 CC **12 Claims**



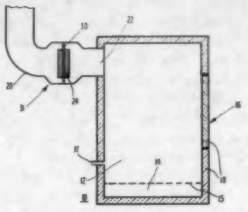
1. An apparatus for feeding pulverized solid fuel to the burners of a kiln comprising distributing means for distributing pulverized solid fuel into a plurality of fuel streams, means for weighing pulverized fuel in each stream, a plurality of air conduits for receiving pulverized fuel therein from said streams and supplying an air-fuel mixture to burners in different regions of the kiln and a driven fuel feed means for feeding the pulverized fuel from each stream to an air conduit at a rate controlled by the respective weighing means.

4,373,452
WOOD BURNING STOVE

Robert V. Van Dewoestine, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 173,155, Jul. 28, 1980. This application Mar. 1, 1982, Ser. No. 353,834
Int. Cl.³ F23J *15/00*
U.S. Cl. 110—203 **16 Claims**

1. In a woodburning stove of the type having:
a combustion chamber, and
a flue for removing exhaust from said chamber, the improvement comprising:
a catalytic converter means for oxidizing oxidizable species in said exhaust, said catalytic converter means comprising a honeycomb structure having a plurality of mutually parallel catalytic cells, each having a flow length oriented in the direction of the flow of said



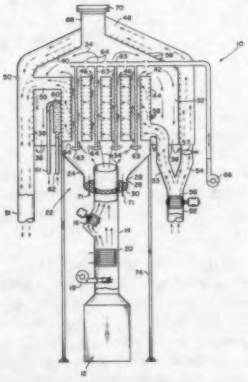
exhaust, and a volume (V) in cubic inches expressed as a function of the cell density (N) of said cells in cells per square inch in a direction perpendicular to said flow being at least:

$$V = \frac{1.35}{N^2} + \frac{400.34}{N} - 0.013.$$

4,373,453
APPARATUS AND METHOD FOR UTILIZING HOT WASTE GASES

Samuel Foresto, 243 Willis Ave., Mineola, N.Y. 11501

Continuation-in-part of Ser. No. 221,974, Jan. 2, 1981, Pat. No. 4,317,417. This application Sep. 16, 1981, Ser. No. 302,487
Int. Cl.³ F23J *3/00*
U.S. Cl. 110—216 **53 Claims**



1. An apparatus for utilizing waste gases comprising
a source in which waste gases are produced,
heat extractor means for extracting heat from the waste gases,
a clean air chamber through which clean air is flowed,
flue means for conducting the hot waste gases to cause the same to flow from the head of said flue means directly from said source into said heat extractor means,
said heat extractor means including means to direct the hot waste gases to pass therethrough in heat exchange relation with said clean air chamber to heat the clean air flowing through said clean air chamber and thereafter to exhaust said waste gases normally from said heat extractor means to the atmosphere in a downward direction of flow,

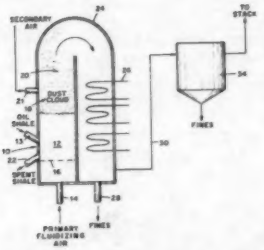
and a flow passage means providing an opening to the atmosphere and through which the waste gases flow from said apparatus to the atmosphere from between said flue means and said heat extractor means when pressure in said heat extractor means exceeds the pressure of the hot waste gases from said flue means.

4,373,454

OIL SHALE RETORTING AND COMBUSTION SYSTEM

Augustine A. Pitrolo, Fairmont; Joseph S. Mei, Morgantown, both of W. Va., and Jerry Y. Shang, Fairfax, Va., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,307
Int. Cl.³ F23B *1/06, 1/38, 5/02*; F23D *1/02*
U.S. Cl. 110—347 **2 Claims**



1. A method for extracting energy values from oil shale having substantial concentrations of calcium carbonate therein, comprising the steps of heating particulate oil shale in a retorting zone in a bed reactor, fluidizing the contents in said zone with air having an oxygen content of about stoichiometric and sufficient to provide for the heating of oil shale to a temperature adequate to thermally decompose the organic hydrocarbons therein and insufficient to provide a temperature adequate to effect substantial combustion of the hydrocarbons extracted from the oil shale or substantial calcination of the calcium carbonate, conducting the extracted hydrocarbons and the calcium carbonate in an upward direction into a freeboard combustion zone, contacting the contents in said freeboard combustion zone with excess air having an oxygen level in the range of about 10 to 85 percent greater than stoichiometric to provide a temperature sufficient to effect the combustion of said volatiles and the calcination of said calcium carbonate in said combustion zone, thereafter extracting sensible heat from the resulting combustion products.

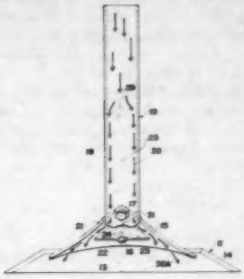
4,373,455

SEED BOOT ASSEMBLY

Terrance Friggstad, Frontier, Canada, assignor to Friggstad Manufacturing Ltd., Frontier, Canada

Filed Jun. 8, 1981, Ser. No. 271,777
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—86 **18 Claims**

1. A seed and/or fertilizer applicating boot assembly for use in conjunction with a sweep secured to a downwardly depending sweep shank and including a securing bolt assembly extending diametrically through said tube from the front to the rear thereof and through the shank to secure said tube to said shank; comprising in combination substantially vertical tube operatively connected to a source of grain and/or fertilizer entrained in an air stream, means in said tube to divide the stream of grain and/or fertilizer into two streams, one at each side of the tube, said means extending along the vertical length of part of said tube, said means including a vertically extending crease formed in the wall of said tube extending inwardly therefrom partway across the bore of said tube, and extending



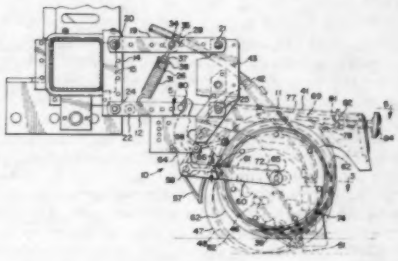
from just above the securing bolt assembly to a point situated adjacent midway along the length of said tube.

4,373,456

AGRICULTURAL FURROW FORMING APPARATUS DEPTH CONTROL

Lawerence D. Westerfield, Romeoville, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed May 20, 1981, Ser. No. 265,514
Int. Cl.³ A01C *5/06*
U.S. Cl. 111—88 **1 Claim**



1. A furrow forming apparatus depth control for a seed planter, comprising:

(a) a frame, said frame being adapted to be attached for towing to a mobile power source;

(b) a pair of opposed furrow forming disks rotatably mounted on said frame, with the disks substantially contacting each other at the approximate point of entry into the soil and diverging apart rearwardly and upwardly relative to the direction of travel;

(c) a pair of gauge wheel means individually mounted on said frame forward of said disks for regulating furrow depth, each means including a support pivotally mounted on said frame, a wheel located generally adjacent an outer surface of a disk and rotatably mounted on said support;

(d) gauge wheel adjustment means movably mounted on said frame for contact with said supports to achieve desired furrow depth, said means including an indicator and a slide slideably mounted on said frame forward of said supports and above the pivotal mounting of said supports on said frame, said slide having a threaded portion and including structure positioned adjacent said supports and extending transversely thereto and to the furrow, a threaded rod engageable with said threaded portion and a knob for rotating said rod for moving said supports equally in the same direction;

(e) furrow depth indicating means having a zero indicating

position and spaced indicia located adjacent said indicator; and

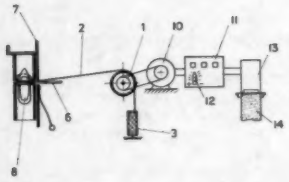
(f) adjustment means for selectively mounting said indicating means on said frame, said adjustment means including a longitudinally spaced pair of slotted holes elongated in the direction of indicator travel in said indicating means and complementary fasteners to selectively secure said indicating means to said frame, whereby with said disks and wheels in contact with a level surface, and said zero indicating position of said indicating means being located opposite said indicator by said adjustment means and secured to said frame, accurate depth control is achieved.

4,373,457

FEED ARRANGEMENT FOR TEXTILE MACHINES

August Heinzle, Altweg 9, A-6844 Altach, Austria

Filed Feb. 20, 1980, Ser. No. 122,847
Claims priority, application Austria, Feb. 20, 1979, 1304/79
Int. Cl.[3] D05C *3/04*; D05B *49/04*
U.S. Cl. 112—96 5 Claims



1. A feed arrangement for feeding and tightening a thread with respect to a foundation in a textile machine which includes a supply of thread and a generally cylindrical thread roller about which the thread is looped at least once to frictionally contact the thread roller, comprising drive means directly connected to the thread roller for rotating the thread roller in one direction about its axis to feed intermittently desired lengths of the thread from the thread supply so that successive stitches of the thread can be formed in the foundation, and for rotating the thread roller in the opposite direction about its axis after each stitch is formed to tighten the thread a desired amount relative to the foundation, and means for controlling said drive means so that different lengths of thread can be fed successively by the thread roller to form corresponding stitches in the foundation during operation of the textile machine.

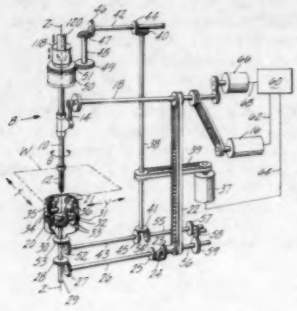
4,373,458

METHOD AND MACHINE FOR VERSATILE STITCHING

Adolph S. Dorosz, Beverly; Patrick N. Kirwan, Danvers, both of Mass., and Nicholas P. Szydlek, Exeter, N.H., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 924,840, Jul. 14, 1978, abandoned. This application Jun. 4, 1981, Ser. No. 271,023
Int. Cl.[3] D05B *21/00*
U.S. Cl. 112—121.12 35 Claims

1. A method of forming stitch paths at selected distances apart on a workpiece translatable in its own general plane which comprises, providing in a sewing machine a needle bar reciprocable on an axis and carrying a plurality of needles into and out of the workpiece from one side thereof, providing a plurality of thread hooking devices operable on thread on the opposite side of the workpiece, each of the thread hooking devices being rotatable about said axis, and causing the needle bar and thread hooking devices to be rotated about the common axis when the plurality of needles are disengaged from the workpiece so that a line interconnecting the tips of the needles at their workpiece engaging localities is maintained at arbitrarily predetermined angles to the translation path of the workpiece during operation of the machine wherein the distance between stitch paths is selectively varied by changing said line



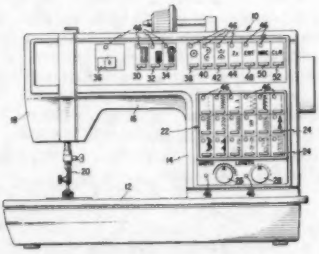
from a maintained perpendicularity to a selected angle or succession of selected angles less than 90°.

4,373,459

ELECTRONICALLY CONTROLLED SEWING MACHINE ARRANGED TO SEW A SEQUENCE OF STITCH PATTERNS

William H. Dunn, Frankford Township, Sussex County; Stephen A. Garron, Elizabeth; Leonard I. Horey, West Orange, and John W. Wurst, Chester Township, Morris County, all of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Aug. 11, 1982, Ser. No. 407,023
Int. Cl.[3] D05B *3/02*
U.S. Cl. 112—158 E 6 Claims

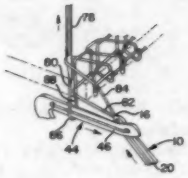


1. An electronically controlled multiple pattern sewing machine including a central control system having a memory storing stitch pattern information, pattern selection input means for transmitting to said central control system a pattern selection signal identifying a selected pattern to be sewn by the sewing machine, alteration function input means for transmitting to said central control system selected pattern alteration function commands associated with a selected pattern on an individual basis to cause said central control system to alter the stored stitch pattern information in accordance with said selected pattern alteration function commands so as to sew a selectively altered version of a selected pattern, and pattern string memory means for storing the sequence of entries each comprising a respective pattern selection signal and associated selected pattern alteration function commands.

4,373,460
SEWING MACHINE LOOPERS

William R. Parker, Mt. Prospect, and Matt J. Gosche, Franklin Park, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Apr. 26, 1978, Ser. No. 900,049
Int. Cl.³ D05B 57/06
U.S. Cl. 112—162 5 Claims

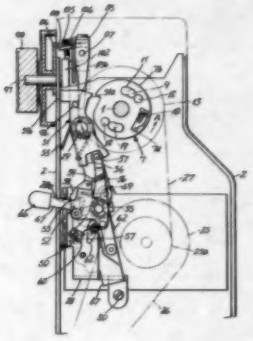


1. A three thread overedge stitch sewing machine having sewing instrumentalities comprising:
a thread carrying needle;
a thread carrying upper looper including:
a point end means;
a heel portion means;
a blade means having a front face means extending from said upper looper point end means to said upper looper heel portion means, said upper looper front face means having an upper edge means and a lower edge means;
a butt end shank means joined to said upper looper heel portion means;
a thread groove means located in said upper looper front face means of said upper looper blade means; and
eye means located in said upper looper blade means at said upper looper point end means, said upper looper thread groove means terminating at said upper looper eye means, said upper looper point end means being disposed between the center line of said upper looper thread groove and eye means and the upper edge of said upper looper front face means, whereas to prevent said upper looper point end means from piercing the previously set stitch when sewing extremely heavy weight material; and,
a thread carrying lower looper including:
a beak end means;
a heel portion means;
a blade means having a front face means extending from said lower looper beak end means to said lower looper heel portion means;
an angled base portion means formed with a shank end means and joined to said lower looper heel portion means;
two eye means located in said lower looper blade means, one of said lower looper eye means being in proximity of said lower looper beak end means and the other of said lower looper eye means being in proximity of said lower looper heel portion means;
a lengthwise thread groove means located in said lower looper front face means of said lower looper blade means, one end terminating at said lower looper beak end eye means and the other end terminating at said lower looper heel portion eye means; and
a bottom face portion means being generally flat and extending the length of said lower looper blade and having a 2° rise at said lower looper beak end means whereas to prevent needle thread loop skips when sewing at extremely high speeds, 8000 stitches per minute range.

4,373,461
SEWING MACHINE WITH A CYCLE PATTERN STITCHING DEVICE

Yasuro Sano, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 177,460
Claims priority, application Japan, Aug. 16, 1979, 54-112054[U]
Int. Cl.³ D05B 69/22
U.S. Cl. 112—274 3 Claims



1. A sewing machine, comprising a housing; an upper shaft turnably mounted in said housing and adapted to reciprocate a needle penetrating a fabric to be sewn; a pulley mounted on said upper shaft freely rotatable relative thereto; means adapted to be driven by a motor for rotating said pulley; clutch means normally connecting said upper shaft to transmit rotation of said pulley to said upper shaft; stop means mounted on said upper shaft for rotation therewith; blocking means displaceable between an inoperative position in which it is spaced from the path of rotation of said stop means and an operative position located in said path to block rotation of said stop means; means cooperating with said stop means and operating said clutch means to disconnect said upper shaft from said pulley when said blocking means blocks rotation of said stop means; cycle stitch control means rotated by said upper shaft at a predetermined speed; regulating means cooperating with said control means while holding said blocking means in said inoperative position; and manually operated means operated to a predetermined position to constantly bias said blocking means toward the path of rotation of said stop means against the action of said regulating means holding the blocking means in the inoperative position, said control means operating said regulating means in one direction to release said blocking means after a predetermined number of revolutions of said upper shaft.

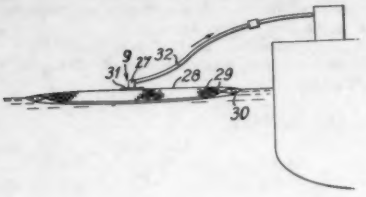
4,373,462
FILLABLE STRUCTURE

Daniel C. E. Fish, Wimbourne, England, assignor to Leigh Flexible Structures Limited, Walsall, England

Filed May 20, 1980, Ser. No. 151,633
Int. Cl.³ B63B 25/08
U.S. Cl. 114—74 R 3 Claims

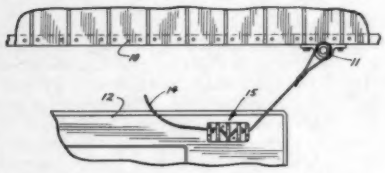
1. A floatable fillable structure comprising flexible pieces fixed together at least along longitudinally extending side seams, each seam defining a laterally extending piece with an internal longitudinally extending passage, discrete buoyancy elements trapped in said passages thereby providing a buoyant, stable structure which floats in the correct orientation, a vent

normally biased to the closed position secured to an upper wall of the structure and a floating spacer composed of a net bag



containing balls under the vent to maintain a gas passage between the vent and the interior of the structure.

4,373,463
CLEAT DEVICE
Jerald G. Beaudette, 5042 Bryant Ave., South, Minneapolis, Minn. 55419
Filed Aug. 5, 1980, Ser. No. 175,484
Int. Cl.³ B63B *21/04*
U.S. Cl. 114—218 **2 Claims**



1. A cleat device on a larger structure for restraining a flexible line including:

A. a base fixedly mounted to said larger structure;

B. a plurality of at least three parallel, spaced-apart, jam cleats mounted on said base in juxtaposition, with adjacent open ends facing in opposition directions, said jam cleats each including a planar upper face and a planar lower face converging to form a first acute angle;

C. at least one of said faces of each of said jam cleats including a longitudinally extending ridge thereon forming a second acute angle with the other face, said rib being centrally aligned with its working face and said rib not extending entirely across the width of the face and said first angle ranges from 10° to 50° and said second angle ranges from 15° to 60°; and

D. means to maintain a line cleated in said jam cleats so that its axis is in direction to maintain said line in jammed relationship with respect to the outermost jam cleats.

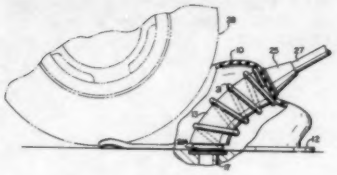
4,373,464
RESILIENT DOME DEVICE
Herbert Blau, Philadelphia, Pa., assignor to Blau & Lapides, Inc., Philadelphia, Pa.
Filed May 27, 1980, Ser. No. 153,280
Int. Cl.³ E01F *9/01, 9/06, 11/00*
U.S. Cl. 116—63 R **10 Claims**

1. A resilient dome device comprising in combination,

(a) a hollow dome made of resilient material, said dome having a top and a base,

(b) a central tubular formation of resilient material secured to and extending vertically centrally downward from the top of the dome substantially to the base of the dome, said tubular formation being open at its upper end and through the top of the dome and downward through at least most of its vertical extent, whereby said tubular formation is adapted to receive within it a cylindrical member projected thereinto,

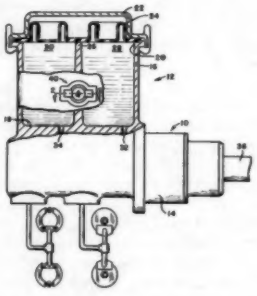
(c) a spring disposed about the outer surface of and extending substantially the full length of the said central tubular



formation thereby helping to restore the resilient dome to its undeformed shape, and

(d) means for connecting said device to a supporting surface against which said dome base is disposable.

4,373,465
VISUAL FLUID LEVEL INDICATOR
Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed Oct. 3, 1980, Ser. No. 193,763
Int. Cl.³ G01F *23/02*
U.S. Cl. 116—227 **1 Claim**



1. In a visual fluid level indicator, a housing having an outer wall extending from a base to an opening which receives the fluid, an inner wall extending from the base toward the opening to substantially form a pair of cavities for carrying the fluid and a transparent plastic plug sealingly coupled to the housing to provide a visual indication of the fluid level within the housing, characterized by said inner wall cooperating with said outer wall to define a passage extending between said pair of cavities at an intermediate location on said inner wall between said base and said opening and said outer wall including an outer wall opening intersecting said passage to communicate with said pair of cavities at a predetermined location relative to said base, said transparent plastic plug including a first diameter portion extending into said outer wall opening and a second diameter portion forming a shoulder with said first diameter portion, said outer wall also including at least one transversely extending tab, said transparent plastic plug including at least one integrally formed resilient projection cooperating with said one transversely extending tab to releasably connect said transparent plastic plug to said housing when said first diameter portion is received within said outer wall opening, said tab including an undercut recess which defines a lock spaced from said outer wall opening and said projection being biased into said undercut recess to define a locking fit spaced outwardly from said shoulder and prevent disconnection of said transpar-

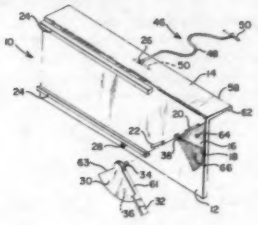
ent plastic plug from said housing, and a sealing ring engaging said first diameter portion, said shoulder and said outer wall.

4,373,466

STOREROOM BIN MARKER

Ralph G. MacPhee, 1209 Fremont Hill Dr., Selah, Wash. 98942

Filed Oct. 24, 1980, Ser. No. 200,391
Int. Cl.³ G09F *3/20, 9/00*
U.S. Cl. 116—315 **11 Claims**



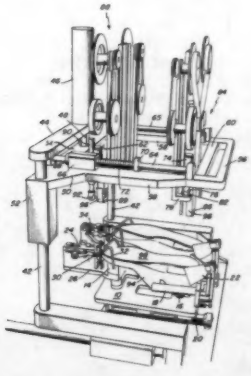
1. A storeroom bin marker comprising:
a base member means having located thereon at least two indicia means; and
a view blocking means mounted to said base member means for rotation about an axis generally perpendicular to said base member means, so said view blocking means rotates in a plane generally parallel to said base member means; wherein said view blocking means is sized and located on said base member means in a way such that in a first position said view blocking means covers all of said indicia means, in a second position said view blocking means does not cover at least one of said indicia means, and in a third position said view blocking means does not cover any of said indicia means; and wherein said bin marker further comprises means for releasably holding said view blocking means in said first and second positions.

4,373,467

MACHINE FOR APPLYING A PATCH OF ADHESIVE ONTO THE BOTTOM OF A LAST

Michael M. Becka, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Jul. 27, 1981, Ser. No. 287,339
Int. Cl.³ B05C *1/02*
U.S. Cl. 118—211 **2 Claims**



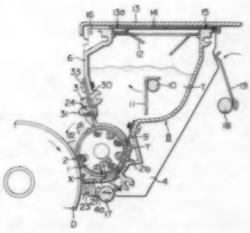
1. A machine for applying a patch of adhesive onto the bottom of a last prior to bonding an insole to the last bottom by means of the adhesive patch comprising: a last support for supporting the last bottom-up with its toe end facing rearwardly; an adhesive applying member, located above the last bottom, mounted for heightwise movement; a toe end contacting member mounted for yieldable forward movement from a rearward idle position spaced from the toe end of the last into a position of engagement with the toe end of the last; means for initially positioning the adhesive applying member in an upper idle position, spaced from the last bottom; and means for thereafter effecting downward movement of the adhesive applying member towards the last bottom to enable the adhesive applying member to engage the last bottom and apply the patch of adhesive onto the last bottom; characterized in that the machine comprises: means for yieldably moving the toe end contacting member forwardly from its idle position into engagement with the toe end of the last prior to effecting the downward movement of the adhesive applying member; means mounting the adhesive applying member for forward-rearward movement; means yieldably urging the adhesive applying member to a rearward position; and cooperative shifting means, formed of a first portion mounted to the toe end contacting member and formed of a second portion mounted for heightwise movement with the adhesive applying member, effective to shift the adhesive applying member forwardly during its downward movement an amount such as to cause the adhesive applying member to engage the last bottom close to and rearwardly of the toe end of the last bottom.

4,373,468

DEVELOPING APPARATUS

Masashi Suda, Iruma, and Junichiro Kanbe, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,451
Claims priority, application Japan, May 17, 1979, 54-60783
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—658 **24 Claims**



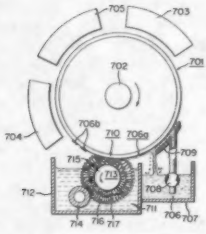
1. A developing apparatus for supplying developer to a latent image on a latent image bearing member to develop it, said apparatus comprising means for supplying one-component magnetic toner as said developer, a movable developer carrying member having a surface for receiving the supplied developer, a thickness limiting member of magnetic material or a magnet disposed close to the surface of said developer carrying member for limiting the layer of developer on said developer carrying member to a predetermined small thickness, fixed magnetic field producing means disposed within said developer carrying member, said magnetic field producing means having a magnetic pole positioned in facing relationship with said thickness limiting member, and means for mounting said thickness limiting member for slideable movement toward and away from the facing magnetic pole, said mounting means including locking means for maintaining a predetermined distance between said thickness limiting member and said developer carrying member, an adjusting plate mounted on said supply means, pin means cooperating with at least one opening in said thickness limiting member for positioning said adjusting plate and said thickness limiting member, and wherein said locking means includes means for connecting said adjusting

plate with said thickness limiting member, and wherein said opening in said thickness limiting member has a diameter larger than that of said pin means, said pin means being offset relative to said opening, said thickness limiting member being adapted to move toward said developer carrying member under the influence of the facing magnetic pole.

4,373,469
APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Tsukasa Kuge, Tokyo; Toru Matsumoto, Kita; Tsuyoshi Watanabe, and Yasuyuki Tamura, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 63,158, Aug. 2, 1979, abandoned, which is a division of Ser. No. 871,710, Jan. 23, 1978, Pat. No. 4,185,129. This application Jan. 30, 1981, Ser. No. 229,935
Claims priority, application Japan, Jan. 28, 1977, 52-8320
Int. Cl.³ G03G *15/10, 21/00*
U.S. Cl. 118—652 **4 Claims**



1. Apparatus for developing electrostatic latent images, comprising:

application means for applying a developer having a high concentration of developer particles uniformly over the image and non-image portions of a latent image bearing surface; and

developing means for applying a liquid to the image bearing surface to remove therefrom developer particles which are not attracted thereto by the coulomb force therebetween and form a developed image, said developing means comprising a liquid reservoir and a composite elastic roller for transferring liquid from said liquid reservoir to the image bearing surface, said composite roller including a core shaft member, an elastic inner layer provided on the circumference of said core shaft member, said elastic layer being elastically deformable and porous to retain liquid, and a sleeve-like net covering said inner layer, said net being made of flexible material and permeable to liquid and developing particles, at least one of said inner layer and net being electrically conductive to eliminate marginal effect in the developed image.

4,373,470
MASK POSITIONING CARRIAGE ASSEMBLY

Richard T. Martin, Goleta, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Feb. 9, 1981, Ser. No. 232,842
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—720 **22 Claims**

1. A carriage assembly for positioning a selected mask from a plurality of masks adapted to be supported thereon between a substrate and a source comprising

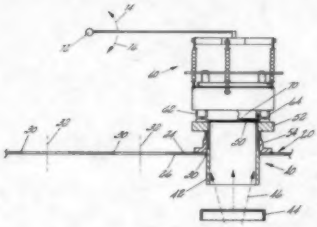
an elongated mask support means including

means adapted for positioning each of said masks in a predetermined position relative to each other in a selected plane;

means defining a guiding element and a supporting element;

means operatively coupled to and for transporting the elongated mask support means and masks supported thereby along a predetermined path and being adapted to position a selected mask at a working station between a substrate located in a plane substantially parallel to said selected plane and a source located in an opposed relation to a said substrate; and

means positioned along said predetermined path for movably engaging at a said working station said means for defining said guiding element and for directing movement thereof along a line of reference within said predetermined path, at least one of said means for defining said guiding element and said movably engaging means including means defining a recessed groove and the other of which defines a protruding lip which movably engage said recessed groove along said line of reference, said guiding element defining means and said movably engaging means



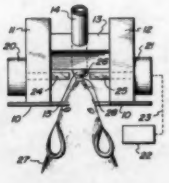
being operative to confine movement of the guiding element to movement thereof along said line of reference; and

means for movably engaging at a said working station said means for defining said supporting element on a surface which affords unconstrained thermal expansion and contraction and distortion of said elongated mask support means in all directions including along said line of reference to minimize lateral variations in position of a said selected mask at a said working station, said transporting means being adapted to move said elongated mask support means including masks supported thereby along said predetermined path relative to a said substrate and a said source independent of unconstrained thermal expansion and contraction and distortion of said elongated mask support means while confining movement of the guiding element along said line of reference.

4,373,471
MONITORING LIQUID CONSUMPTION OF A LABORATORY ANIMAL

John N. Coulbourn, Box 2551, Lehigh Valley, Pa. 18001

Filed Jul. 27, 1981, Ser. No. 287,255
Int. Cl.³ A01K *7/00*
U.S. Cl. 119—72 **10 Claims**



1. A method of monitoring liquid consumption of a laboratory animal which does not involve passing an electric current through any portion of the body of said animal, comprising the steps of:

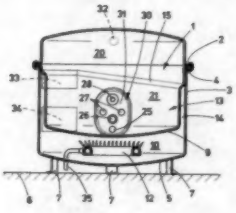
(a) establishing a liquid feeding station;
(b) locating the terminus of a drinking tube within said station and connecting the other end of said tube to a source of the liquid to be consumed by the animal, thus maintaining a meniscus of liquid at said terminus;
(c) providing a photo-electric source and a companion photo-electric cell proximate said station but out of reach of said animal;
(d) piping a beam of light from said source to one side of said meniscus and piping said beam back to said cell from the other side of said meniscus, thereby completing a photo-electric circuit containing a gap therein which spans said meniscus;
(e) adjusting the location of the gap with respect to said tube terminus, as a function of the species of animal being monitored, so that the particular animal directly breaks the beam of light only when it is taking fluid from the drinking tube;
(f) linking the output of the photocell to a counter; and,
(g) counting the number of times the beam of light is broken; whereby the drinking habits of the animal are accurately monitored.

4,373,472

WATER HEATER

Philipp Kreis, Munich, Fed. Rep. of Germany, assignor to GmbH & Co. TRUMA-Geratebau, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,668
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012548
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—14 **8 Claims**



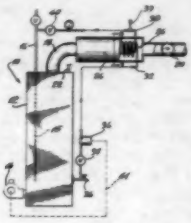
1. In a water heater for gaseous or gasified liquid fuels, especially for installation in mobile accommodation such as mobile homes, caravans or in mountain huts or similar small rooms, having a closed water container of approximately circular cross-section, a housing surrounding at least the lower section of said water container, said housing being closed at the bottom by means of a base and forming, in conjunction with the base of the water container, a gas-tight combustion chamber, a lower induction aperture for fresh air and an upper extraction aperture for waste gases and passages through the water container for inlet and outlet pipes, the improvement which comprises an annular space connected with the combustion chamber formed between the housing and the water container, both the waste gas extraction aperture and the fresh air induction aperture being located in the housing, one or two box-shaped corner sections having side walls and an outer wall portion in one side wall for one or both apertures having a fresh air chamber, adjoining the housing and, by means of their side walls, converting the housing in the vicinity of the corner sections into a rectangular shape, and a connecting aperture to link up with a through-flow unit in the outer wall portion being provided in one side wall.

4,373,473

HEAT RECUPERATING WATER HEATING SYSTEM

Robert Grandmont, Sherbrooke, Canada, assignor to 110707 Canada Ltee, Quebec, Canada

Filed Mar. 16, 1981, Ser. No. 243,764
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 B **8 Claims**



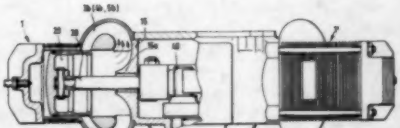
1. A heat recuperating water heating system comprising:
a water receiving enclosure;
a water inlet to and a water outlet from said enclosure;
a burner to provide a source of heat for heating water in said enclosure;
a flue to carry away products of combustion from said heat source;
a manifold in said flue;
a continuous coil line in said manifold, said coil line being doubly wound to define a pair of inner and outer concentric loops; said coil line having one end connected to a first conduit in communication with said water inlet and the opposite end connected to a second conduit in communication with said water outlet;
water circulating means in said second conduit between said opposite end of said coil line and said water outlet; and
electrical means connecting said water circulating means to said burner to set said circulating means in operation each time said burner is operated, said water circulating means being set to provide a determined flow of water in said coil.

4,373,474

SCAVENGING ARRANGEMENT FOR A TWO-STROKE INTERNAL COMBUSTION PISTON ENGINE

Manfred Schindler, Markt Schwaben; Reinhold Ficht, Kirchseeon, and Hermann Vogt, Fürmoosen, all of Fed. Rep. of Germany, assignors to Ficht GmbH, Kirchseeon, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 221,196
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041560
Int. Cl.³ F02B *75/24*
U.S. Cl. 123—56 B **7 Claims**



1. Two-stroke internal combustion piston engine comprising a pair of axially elongated cylinders disposed in axial alignment and spaced axially apart, a separate piston reciprocally movable in each said cylinder in the axial direction thereof and

having a bottom dead center position within said cylinder, a separate piston rod connected to each said piston and said piston rods disposed in axial alignment, a rotating crank guide assembly located between said cylinders and coupling said piston rods for reciprocating said piston rods in the axial direction of said cylinders, said cylinders each including a cylinder wall extending in the axial direction of said cylinder defining the axially extending inner surface thereof, each said cylinder having an axially extending plane symmetrically dividing the interior of said cylinder, each said cylinder wall having an exhaust opening from the interior of said cylinder located in the region adjacent the bottom dead center position so that said exhaust opening is open when said piston is in the bottom dead center position, said exhaust opening being symmetrically arranged relative to the axially extending plane in said cylinder and extending in the axial direction of said cylinder, each said cylinder wall having a plurality of scavenging openings therethrough opening into the interior of said cylinder, said scavenging openings being arranged in a number of pairs with each pair being symmetrically arranged relative to the axially extending plane so that each scavenging opening of one pair is located on an opposite side of the axially extending plane from the other said scavenging opening thereof, the axial extent of said scavenging openings are located in the axially extending region of said exhaust opening, said scavenging openings are spaced angularly from said exhaust opening relative to the axial direction of said cylinders, duct means for supplying the scavenging medium to said scavenging openings, said scavenging openings having first side surfaces extending in the axial direction of said cylinder and second side surfaces extending transversely of the axial direction of said cylinder, a first pair of said scavenging openings being located more remote from said exhaust opening than the other said scavenging openings, a second pair of said scavenging openings being located closer to said exhaust opening than the other said scavenging openings, the projection of said first side surfaces of said pairs of scavenging openings opening into the interior of said cylinder each intersect in an arrow-like shape with the point at the intersection directed away from said exhaust opening, the projections of said first side surfaces of said first pair of said scavenging openings forming an angle on the sides of said projections closer to said exhaust opening greater than the angle formed by said first side surfaces of the remaining pairs of said scavenging openings, with the arrow-like shaped angles formed thereby decreasing as said pairs of scavenging openings are located closer to said exhaust opening, and the projection of said second side surfaces of said pairs of scavenging openings extending into the interior of said cylinder forming an acute angle with a plane extending perpendicular to the axial direction of said cylinder and the acute angle formed by said first pair of scavenging openings being greater than the acute angle formed by said second side surfaces of the remaining said pairs of scavening openings with the acute angle formed thereby decreasing as said pairs of scavenging openings are located closer to said exhaust opening, so that the individually directed flows from the differently directed pairs of said scavenging openings build upon one another and initially flow away from said piston in the bottom dead center position to the opposite end of said cylinder and then reverse direction at the opposite end of said cylinder and flow toward said piston for displacing residual gases of the preceding working stroke out of said exhaust opening.

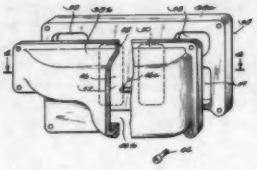
4,373,475

INTERNAL COMBUSTION ENGINE

J. David Kirk, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 18, 1980, Ser. No. 217,858
Int. Cl.³ F02B *75/20, 33/04*
U.S. Cl. 123—59 B **10 Claims**

1. An internal combustion engine comprising a cylinder block having a bore, means for forming in said cylinder block first, second, and third openings, each of said openings communicating with said bore, said cylinder block also having means defining an exhaust passage spaced from said bores, and a cover member removably attachable on said cylinder block and including means defining a first cavity communicating with said first opening and with said exhaust passage when said



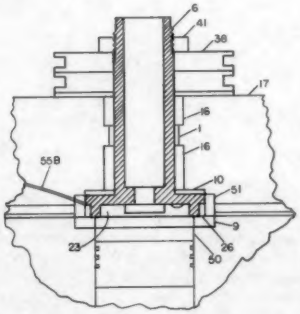
cover member is attached on said cylinder block and means defining a second cavity communicating with each of said second and third openings when said cover member is attached on said cylinder block.

4,373,476

ROTARY VALVE SYSTEM

Joseph P. Vervoordt, 432 Monroe Ave., and Joseph J. Gorzynski, 259 Prospect Ave., both of New Milford, N.J. 07646

Filed Mar. 7, 1980, Ser. No. 128,293
Int. Cl.³ F01L *7/06*
U.S. Cl. 123—80 D **5 Claims**



1. A rotary valve system for internal combustion engines including a valve disc jacket having an aperture therein and predetermined inlet and outlet passages, the combination comprising:

an elongated substantially cylindrical valve passage means having a threaded section at one end and an outwardly extending disc portion at the other end having a downwardly extending circumferential wall with a predetermined aperture extending therealong, said disc portion having a bottom surface comprising the upper surface of a combustion chamber and an upper surface and including at least one shaped protrusion thereon for purposes of charge stratification,

a ring seal having a predetermined aperture therethrough for mating with the corresponding aperture in the circumfer-

ential wall of the disc portion, said apertures periodically cooperating with the inlet and outlet passages in the valve disc jacket, and,

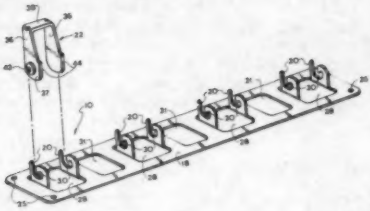
an impregnated sleeve insert mounted between the upper surface of the disc portion and the valve disc jacket to provide a contact running surface that is run dry.

4,373,477

LASH ADJUSTER WITH PLUNGER RETAINER

Stephen M. Buente, Kalamazoo, and George A. Hillebrand, Battle Creek, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1980, Ser. No. 220,490
Int. Cl.³ F01L *1/24, 1/14*
U.S. Cl. 123—90.55 **8 Claims**



1. A lash adjuster for valve gear of an internal combustion engine comprising:

(a) body means including structure defining a bore therethrough, said bore terminating in an internal face;

(b) plunger means slidably received in said bore, said plunger means including structure defining a plunger body having a bore therein with a piston slidably received in said bore in precision closely fitting relationship thereto, said piston and said plunger body cooperating to define a fluid pressure chamber therebetween;

(c) one-way valve means disposed in said plunger means and operable to permit flow of fluid into said fluid chamber upon movement of said piston in a direction outwardly of said plunger body;

(d) said plunger means and said body means defining a fluid reservoir for supplying fluid to said one-way valve means;

(e) said body means defining a passage for communicating pressurized fluid to said fluid reservoir; and

(f) means for retaining said plunger means within said bore prior to assembly of said lash adjuster into said valve gear, said retaining means including,

(i) said plunger body defining a ramp surface adjacent said end portion,

(ii) fastener means including an elastically deformable member disposed in engagement with said plunger body, said ramp surface being operable upon insertion of said plunger means in said bore to elastically deform said member radially outwardly and subsequently cause said member to engage said plunger means in snap locking arrangement for preventing removal of said plunger means from said bore.

4,373,478

APPARATUS FOR RELEASABLY SECURING IGNITION DEVICES

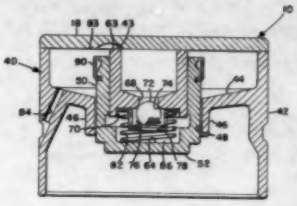
Sultan A. Rifat, 159 Gelston Ave., Brooklyn, N.Y. 11209

Filed Apr. 27, 1981, Ser. No. 258,023
Int. Cl.³ F02P *13/00*
U.S. Cl. 123—169 R **8 Claims**

1. Apparatus for use with a combustion engine of the type including a cylinder head having a plurality of bores therein for receiving a plurality of non-externally threaded ignition devices, said apparatus releasably securing said ignition devices in said bores and facilitating the insertion and removal of said ignition devices therefrom, said apparatus comprising:

means, separate from said ignition devices, defining a pair of slots about each of said bores;

a plurality of retaining members, one for each ignition device, each retaining member having a bearing surface and a pair of projections receivable in a pair of slots disposed about a bore; and



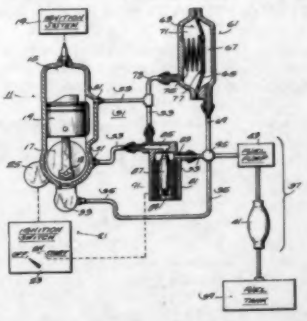
means for releasably securing said projections in said slots with said bearing surfaces abutting said ignition devices and urging said ignition devices into said bores.

4,373,479

FUEL SYSTEM PROVIDING PRIMING AND AUTOMATIC WARM UP

Henry C. Billingsley, Waukegan, and Chester G. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 7, 1980, Ser. No. 176,079
Int. Cl.³ F02M *1/16*
U.S. Cl. 123—187.5 R **10 Claims**



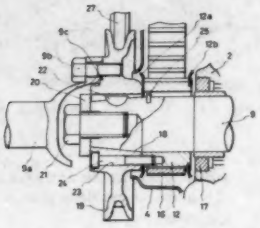
1. A fuel supply system for an internal combustion engine including a combustion chamber and a rotatably mounted crankshaft, said fuel system comprising means operable for supplying priming fuel to said combustion chamber and for automatically supplying additional fuel to said combustion chamber independently of crankshaft rotation and in response to supplying priming fuel to said combustion chamber and initiation of engine starting.

4,373,480

CONSTRUCTION OF POWER TRANSMITTING DEVICE FOR INTERNAL COMBUSTION ENGINE

Mitsuo Shikata, Toyonaka, and Kazuto Usui, Osaka, both of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Mar. 10, 1980, Ser. No. 128,965
Claims priority, application Japan, Jan. 17, 1980, 55-3970
Int. Cl.³ F02F 7/00
U.S. Cl. 123—195 A 2 Claims



1. A power transmitting device for an internal combustion engine, said device comprising:

(a) a crankshaft having a tapered end portion;

(b) a timing belt pulley mounted on said crankshaft adjacent to said tapered end portion;

(c) a transmission shaft having first shoulder means spaced radially outward at one end thereof, wherein said power take out pulley includes second should means and wherein said transmission shaft is fixedly connected to said take out pulley with said first shoulder means engaging said second shoulder means; and

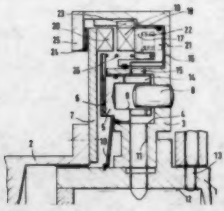
(d) a power take-out pulley mounted by fixing it in position on said crankshaft on the tapered end portion thereof; wherein the timing belt pulley is fixed to the power take-out pulley by fixing the power take-out pulley to the tapered end portion of the crankshaft and then fixing the timing pulley to the power take-out pulley.

4,373,481

DEVICE FOR CONTROLLABLE COUPLING OF TWO SHAFT PARTS WITH A PREDETERMINED ANGLE OF ROTATION CORRELATION

Hermann Krüger, and Michael Willmann, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,557
Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017092
Int. Cl.³ F02D 13/06, 17/00; F02B 75/32; F16D 25/10
U.S. Cl. 123—198 F 20 Claims



1. In a multicylinder internal combustion engine having a first crankshaft part and a second crankshaft part, a device for coupling said first and second crankshaft parts at a predetermined relative angular position comprising:

a friction clutch means for pre-coupling said first and second crankshaft parts, for attaining substantially the same speed of rotation, having a first thrust element coupled to said first shaft part, wherein said thrust element is rotatable over an angle relative to said first shaft between a first angular position and a second angular position, and a clutch plate coupled to said second shaft part for engaging said thrust element;

means for actuating said friction clutch means, wherein said thrust element is maintained in said first angular position during initial actuation of said friction clutch means and moves to said second angular position in response to a reversal in torque transmission between said crankshaft parts;

engagement means for achieving positive locking engagement between said first shaft part and said second shaft part, comprising a first engagement element mounted to said first shaft part to be axially displaceable therealong, and a second engagement element fixed to said second shaft part, wherein said engagement elements positively engage only at a predetermined relative angular position wherein said friction clutch means includes means for preventing the engagement of said engagement elements when said thrust element is in said first angular position; and

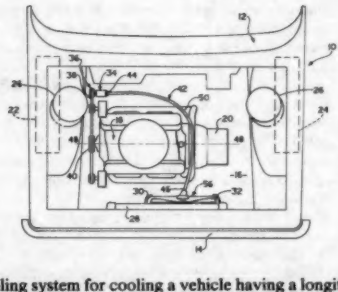
means for actuating said engagement means when said thrust element is in said second angular position.

4,373,482

FLEXIBLE SHAFT FAN DRIVE

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 2, 1981, Ser. No. 230,844
Int. Cl.³ F02B 77/00
U.S. Cl. 123—198 R 8 Claims



1. A cooling system for cooling a vehicle having a longitudinally extending axis, a front end facing in the direction of vehicle movement along said longitudinal axis, a rear end relative to said longitudinal axis, a pair of wheels at said front end rotatable about an axis traversing said longitudinal axis, and an engine located within said front end of said vehicle and having a crankshaft rotatable about an axis traversing said longitudinal axis, said engine having a front end facing one of said wheels and a rear end facing the other of said wheels along said crankshaft axis, and a radiator traverse to said longitudinal axis and located forwardly of said engine in said front end of said vehicle, the improvement comprising:

(a) a pulley located at said front end of said engine and driven by said crankshaft, said pulley having a front end located in the direction of said front end of said engine and a rear end located in the direction of said rear end of said engine along an axis substantially parallel to said crankshaft axis;

(b) a propeller type cooling fan located juxtaposition said

radiator for moving air through said radiator along said longitudinal axis;

(c) a flexible shaft terminating at a pair of ends and extending a distance from said pulley at a location rearwardly of said crankshaft axis along a line traverse to said longitudinal axis and then bending along a curve and extending a distance toward said fan;

(d) means securing one end of said shaft at the rear end of said pulley for rotation of said shaft with said pulley; and

(e) means securing the other end of said shaft with said fan for rotating said fan.

4,373,483

LUBRICATING OIL PUMP DRIVE FOR AN INTERNAL COMBUSTION ENGINE

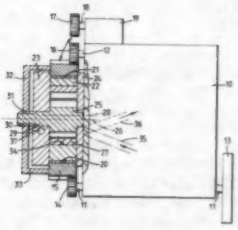
Cecil T. Bury, Huddersfield, England, assignor to David Brown Tractors Ltd., Huddersfield, England

Filed Mar. 3, 1981, Ser. No. 239,237

Claims priority, application United Kingdom, Mar. 19, 1980, 8009307

Int. Cl.³ F02B 77/14

U.S. Cl. 123—198 C **5 Claims**



1. An internal combustion engine having a train of toothed gears including an idler gear driveably connecting its crankshaft to its camshaft, wherein its lubricating oil pump is of the internal gear type and is housed within and driven by said idler gear.

4,373,484

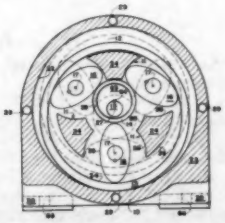
ROTARY PISTON MECHANISM

Daniel E. Boehling, 2341 Castlebridge Rd., Midlothian, Va. 23113

Filed Oct. 6, 1980, Ser. No. 194,190

Int. Cl.³ F02B 53/02

U.S. Cl. 123—241 **8 Claims**



1. A rotary piston mechanism comprising:

a. a stator enclosure of fixed volume defined by two side plates spaced apart in gas-tight engagement with a circuitous boundary wall perpendicular to said plates, said boundary wall having a center of symmetry and being the interior portion of a housing of substantially uniform thickness having opposed flat outer faces,

b. three filler blocks of substantially identical shape and volume fixedly positioned within said enclosure and spaced 120° apart with respect to said center of symmetry, said blocks having opposed flat outer faces and four edge walls perpendicular thereto, including inner and outer edge walls, said outer edge wall being further from said center of symmetry than said inner edge wall, and two side edge walls of identical opposed curvilinear contour, said blocks being symmetrical about a plane perpendicular to said outer faces and bisecting said inner and outer edge walls,

c. rotor components disposed within said enclosure, said rotor components being of uniform thickness and having flat outer faces disposed to lie in close parallel association with said side plates, and having boundary edge walls perpendicular to said side plates, said rotor components comprising

i. a floating outer ring having concentric inside and outside circular boundary walls, said ring encompassing said three blocks and adapted to undergo rotative motion in a manner eccentric to said center of symmetry,

ii. an internal ring disposed about said center of symmetry and within an area bounded by said three filler blocks and adapted to undergo rotative motion in a manner eccentric to said center of symmetry and in a direction opposite to the motion of said outer ring, and

iii. three identical elliptic plates, each located in spaces formed between respective filler blocks, and adapted for rotation about axles perpendicularly centered therein, said axles being supported by said side plates at sites between said blocks in a manner such that rotation of said elliptic plates causes continuous rolling contact with said internal ring and inside circular boundary wall of said outer ring, whereby when said elliptic plates are rotated in the same direction, three chambers of variable volume are defined within said outer ring, and none of said rotor components contact said filler blocks,

d. a power delivery shaft which passes perpendicularly through said side plates at said center of symmetry,

e. means for coupling at least one rotor component to said power delivery shaft,

f. apertures positioned within said side plates to permit gas to enter and exit said chambers of variable volume, and

g. grooves provided in the outer faces of said elliptic plates adapted to control the flow of gas from said chambers through said apertures.

4,373,485

CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 20, 1981, Ser. No. 265,405

Claims priority, application Japan, Jul. 14, 1980, 55-99040[U]; Jul. 15, 1980, 55-99530[U]

Int. Cl.³ F02M 11/04

U.S. Cl. 123—340 **6 Claims**

1. A carburetor for an internal combustion engine of an automotive vehicle, the vehicle being equipped with a transmission, the carburetor comprising:

(a) primary and secondary barrels, the primary barrel comprising,

(1) a primary air intake passage,

(2) a primary venturi arranged in the primary air intake passage,

(3) a primary throttle valve arranged in the primary air intake passsage downstream of the primary venturi,

the secondary barrel comprising,

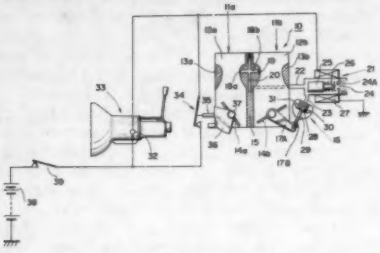
(4) a secondary air intake passage,

(5) a secondary venturi arranged in the secondary air intake passage,

(6) a secondary throttle valve arranged in the secondary air intake passage downstream of the secondary venturi;

(b) a vacuum responsive actuator connected to the secondary throttle valve to operate the same;

(c) a passageway opening to the primary and secondary venturis for obtaining a resultant of the primary and secondary venturi vacuums and introducing the resultant vacuum into the actuator so that the secondary throttle valve will be opened as the resultant vacuum rises;



(d) a sensor for detecting whether a low-speed gear is engaged in the transmission; and

(e) a valve responsive to the sensor for controlling the introduction of the resultant vacuum into the actuator;

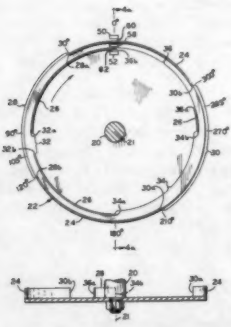
whereby the secondary throttle valve is closed irrespective of the resultant vacuum when the low-speed gear is engaged in the transmission.

4,373,486

ROTATIONAL POSITION AND VELOCITY SENSING APPARATUS

Gary R. Nichols, Woodburn, Ind., and John J. Kozlowski, Jr., Margate, Fla., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 9, 1981, Ser. No. 223,779
Int. Cl.³ F02P *5/04*; G01M *15/00*
U.S. Cl. 123—414 **22 Claims**



1. Rotational position sensing and output apparatus for a shaft rotatable about an axis for sensing a predetermined number of rotational positions of said shaft, comprising;

first means for generating a predetermined number of two digit binary signals corresponding to the predetermined number of rotational positions of said shaft;

second means for receiving said signals and for providing a predetermined number of separate binary waveforms each having at least two transitions between "0" and "1" for each revolution of said shaft;

said second means comprising means for recognizing transitions from one two digit binary signal to another two digit binary signal whereby additional rotational positions of the shaft are recognized;

said first means comprises a disk rotatably driven by the shaft;

first and second circular rims of magnetic field shunting material projecting from one side of said disk; said first and second rims being concentric with the shaft axis and having first and second radii, respectively;

first notches, each of predetermined arcuate length and angular position being formed in said first rim and second notches each of predetermined arcuate length and angular position being formed in said second rim;

a magnet having north and south poles being mounted in fixed relation to and on a radius of the axis of said shaft;

a first Hall-effect sensor, having an output, being mounted in fixed relation to the shaft axis and on said radius and being radially spaced from said north poles to define a first flux gap;

a second Hall-effect sensor, having an output, and being mounted in fixed relation to the shaft axis and on said radius and being radially spaced from said south pole to define a second flux gap;

said first rim being in radial registration with said first gap, and said second rim being in radial registration with said second gap;

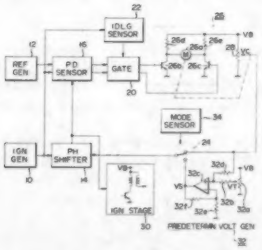
said first and second rims passing freely through said first and second gaps, respectively, upon shaft rotation, causing the outputs of said Hall-effect sensors to alternate between binary level "1" and binary level "0" as a notch or rim passes through their respective gaps.

4,373,487

IGNITION TIMING CORRECTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Satoshi Komurasaki, and Tsuneo Yamane, both of Himeji, Japan

Filed Mar. 31, 1981, Ser. No. 249,459
Claims priority, application Japan, Apr. 3, 1980, 55-44405
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—418 **4 Claims**



1. An ignition time correcting system for an internal combustion engine comprising a reference generator means for generating a reference signal at a reference angular position of the rotation of an internal combustion engine, an ignition generator means for generating an ignition signal at an angular position of the rotation of the engine leading that for said reference signal, said ignition signal having a predetermined advance characteristic, a phase shifter means connected to said ignition generator means to control a retardation of said ignition signal in response to a control input applied thereto, an ignition means connected to said phase shifter means to generate an ignition voltage with an output from said phase shifter means, a control signal generator means for generating a control signal for determining the retardation of said ignition signal provided by said phase shifter means, a control means for controlling a magnitude of said control signal in response to the phase relationship between said reference signal and said output from said phase shifter means so as to impart to said output from said

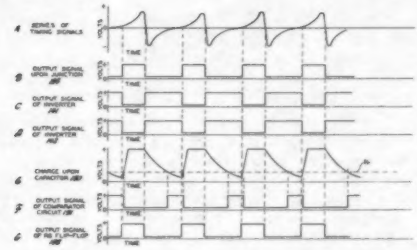
phase shifter means a predetermined phase relative to said reference signal in a predetermined mode of operation of the internal combustion engine, and means for changing the magnitude of said control input to said phase shifter means from its magnitude determined by said control signal to its magnitude predetermined by a predetermined mode of operation of the internal combustion engine.

4,373,488

INTERNAL COMBUSTION ENGINE ELECTRONIC IGNITION SYSTEM

Michael A. Neuhalfen, Galveston, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1981, Ser. No. 264,663
Int. Cl.³ F02P *5/08*
U.S. Cl. 123—418 **5 Claims**



1. In an internal combustion engine electronic ignition system of the type that includes mutually exclusive discrete circuits responsive to each selected half cycle of a series of alternating current timing signals produced in synchronism with an associated engine that are operative, respectively, to effect engine speed ignition spark advance adjustment and to produce a series of substantially square wave electrical signals having leading and trailing edges with the trailing edges being substantially coincident with the point of zero crossover of each selected half cycle of the timing signals into the next half cycle, the improvement of circuitry operative to inhibit engine speed ignition spark advance adjustment with engine speeds less than a selected value, comprising:

means responsive to said square wave electrical signal trailing and leading edges for producing a time variable electrical signal that is initiated at each said trailing edge, changes from a selected initial level with time toward another level at such a rate as to attain a selected second level only when said engine speed is less than said selected value and is terminated at each said leading edge;

means responsive to said time variable electrical signal attaining said selected second level when said engine speed is less than said selected value and the said leading edge of the next said square wave electrical signal for producing an electrical signal and to the said trailing edge of the same said square wave electrical signal for terminating said electrical signal; and

means for applying said electrical signal to said circuitry operative to effect engine speed ignition spark advance in such a manner as to inhibit the operation thereof.

4,373,489

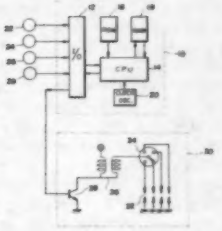
SPARK TIMING CONTROL SYSTEM

Hiroshi Yamaguchi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 26, 1980, Ser. No. 190,952
Claims priority, application Japan, Sep. 28, 1979, 54-124172
Int. Cl.³ F02P *5/14*
U.S. Cl. 123—422 **6 Claims**

1. A spark-timing control system for controlling the timing of ignition spark in an internal combustion engine, said system being associated with a fuel control means for terminating fuel delivery to said engine when the engine speed is above a predetermined value and in the presence of a deceleration condition, said fuel control means being operable to resume fuel delivery to said engine in response to a demand therefor when the engine speed falls below the predetermined value or in the presence of an acceleration condition, said system including a digital computer operable to:

(a) calculate an optimum value of spark timing in terms of engine load at which said engine is operating;



(b) retard the spark timing by a retard value with respect to the calculated optimum spark timing value upon the occurrence of a demand for fuel delivery resumption;

(c) maintain the spark timing of a series of successive sparks retarded by the retard value with respect to the calculated optimum spark timing value for a predetermined time after the occurrence of the demand for fuel delivery consumption; and

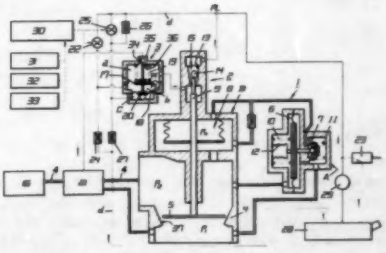
(d) after the step (c), gradually advancing the spark timing to the calculated optimum spark timing value.

4,373,490

FUEL INJECTION APPARATUS

Kei Kimata, Ama, and Tsugito Nakazeki, Iwata, both of Japan, assignors to NTN Toyo Bearing Company, Limited, Osaka, Japan

PCT No. PCT/JP80/00140, § 371 Date Jan. 14, 1981, § 102(e) Date Jan. 14, 1981, PCT Pub. No. WO81/00020, PCT Pub. Date Jan. 8, 1981
PCT Filed Jun. 20, 1980, Ser. No. 225,111
Claims priority, application Japan, Jun. 25, 1979, 54-80605
Int. Cl.³ F02D *3/00*
U.S. Cl. 123—452 **9 Claims**



1. A fuel injection apparatus of the type comprising air flow rate detecting means having a servomechanism and a valve opening mechanism for maintaining at a predetermined value the pressure difference across a throttle valve disposed in a suction pipe and detecting the flow rate of air to an internal combustion engine from the degree of opening of said throttle valve, fuel flow rate measuring means disposed in a fuel supply passage and having a fuel measuring gate which is connected

to said throttle valve and whose degree of fluidcommunication uniquely corresponds to the degree of opening of said throttle valve, pressure adjusting means for regulating the pressure differences across said fuel measuring gate, a plurality of sensor means for sensing the operating conditions of the engine and for emitting sensed signals, electronic control unit means which receives said sensed signals and emits control signals based on said sensed signals, and a first solenoid valve disposed in a fuel pressure control circuit and adapted to be opened and closed by said control signals which are emitted from said electronic control unit means for adjusting a set value of said pressure adjusting means by the open-close action thereof to compensate the air-fuel ratio so as to adapt to all the operating conditions of said engine, characterized in that said fuel injection apparatus further comprises a second solenoid valve disposed in said fuel pressure control circuit in parallel with the first solenoid valve, said solenoid valve being adapted to be opened and closed by output time ratio of fuel rich and lean signals which are emitted from said electronic control unit means so as to correct the basic air-fuel ratio determined in connection with said servo-mechanism of the air flow rate detecting means and said fuel measuring gate when said engine is in operating condition, thereby maintaining said fuel-air ratio at a desired constant value.

4,373,491

FUEL SUPPLY SYSTEM

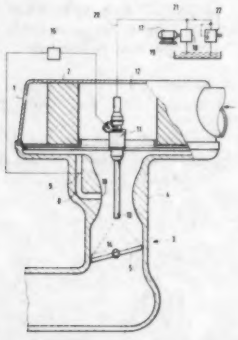
Heinrich Knapp, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 265,758

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019544

Int. Cl.³ F02M *61/14*

U.S. Cl. 123—472 **4 Claims**



1. A fuel supply system for mixture-compressing internal combustion engines with externally supplied ignition comprising an air intake tube, an air filter positioned relative to said air intake tube, said air intake tube having a venturi-like section, an arbitrarily actuatable throttle device in said intake tube downstream of said venturi-like section, a fuel injection valve upstream of said throttle device for injecting toward said throttle valve a quantity of fuel corresponding to the quantity of air aspirated by the engine, an air bypass line connected to said venturi-like section of said air intake tube, an air flow rate meter in said air bypass line and further that said injection valve includes a portion arranged to protrude into said air filter upstream of said venturi-like section, and said injection valve comprises a slender mouthpiece which extends through said venturi-like section so that fuel can be ejected upstream of said throttle device downstream of said venturi-like section.

4,373,492

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINE

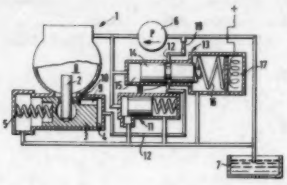
Karl Konrath, Ludwigsburg, and Helmut Laufer, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,509

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931908

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—502 **1 Claim**



1. A fuel injection pump for internal combustion engines comprising a supply pump having a supply side and a suction side, a suction chamber which receives fuel from said supply pump, a piston cylinder juxtaposed said suction chamber in a fluid working relationship with said supply side of said pump, an adjusting piston in said piston cylinder, means extending from said suction chamber into said piston cylinder for movement by said adjusting piston; a piston restoring force means in one end of said piston cylinder and a work chamber in the end of said piston cylinder opposite from said restoring force means for adjusting said piston counter to a restoring force of said piston restoring force means, a throttle connection in said adjusting piston for admitting fluid under pressure from said supply pump to said work chamber in proportion to rpm for adjusting an injection onset of said pump, a pressure control valve for controlling fluid pressure from said supply pump to said restoring force end of said piston cylinder in accordance with rpm, a slide valve, a relief line connecting with said work chamber and to said suction side of said supply pump through a passageway in said slide valve so that pressure in said work chamber is variable by varying a control cross-section of said passageway which results in varying the injection onset of said pump by movement of said piston, said slide valve connected with said pressure side of said pump and said relief line operating to control the cross-section of said passageway in said slide valve; said slide valve including a control spring end and a pressure end, said control spring end including a control spring and a valve adjusting member therein, said slide valve being activated by fluid pressure as determined by said pressure control valve and said control spring, wherein an initial stress on said control spring is a function of said adjusting member in accordance with operational characteristics of said engine.

4,373,493

METHOD AND APPARATUS FOR UTILIZING GASEOUS AND LIQUID FUELS IN AN INTERNAL COMBUSTION ENGINE

James W. Welsh, 75 Templar Way, Summit, N.J. 07901

Filed Jun. 18, 1980, Ser. No. 160,501

Int. Cl.³ F02M *21/02, 13/08*

U.S. Cl. 123—525 **12 Claims**

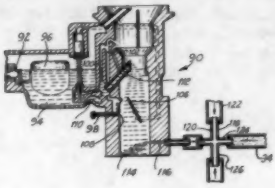
1. A method for utilizing both gaseous and liquid fuels in a standard internal combustion engine utilizing a carburetor having a throttle valve therein for cutting off the supply of air and liquid fuel to the carburetor while the engine is in a no-load idle operating state, said method comprising:

supplying liquid fuel and air to the engine carburetor,

supplying gaseous fuel from a separate gaseous fuel reservoir at regulated pressure stored under substantially high pressure and released from the reservoir at a lower regulated

pressure mixing said gaseous fuel with air from a supply independent of the liquid fuel air supply, and feeding the gaseous fuel and air mixture directly to the intake manifold of said internal combustion engine at a point between the carburetor throttle valve and the manifold,

controlling the flow of liquid fuel from said carburetor to said engine manifold to preclude feeding of liquid fuel to said manifold while the engine is in a no-load idling operating state,



supplying only the gaseous fuel and air mixture to said engine manifold at a controlled rate while said engine is in said no-load idling state, and

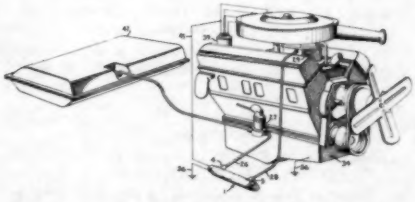
feeding increasing quantities of both gaseous and liquid fuels to said manifold responsive to increasing engine loads, the feeding of gaseous fuel being controlled by the manifold vacuum, volume displacement of the engine cylinders.

4,373,494

TREATMENT OF FLUID HYDROCARBON FUELS WITH ELECTRIC FIELDS

Roy C. McMahon, Kansas City, Mo., assignor to Electrostatic Equipment Company, Kansas City, Mo.

Filed Aug. 27, 1980, Ser. No. 181,689
Int. Cl.³ F02M *27/04*
U.S. Cl. 123—538 **17 Claims**



1. In combination with an internal combustion engine and a fuel source, a treater for treating a liquid hydrocarbon fuel to be combusted in said engine; said treater being fuel flow positioned between said fuel source and said engine so as to improve the combustion efficiency of the fuel; said treater comprising the combination of:

(a) an elongated conductive inner electrode;

(b) an elongated conductive cylindrical outer electrode positioned substantially coaxially about said inner electrode to define an elongated annular treater region therebetween;

(c) a dielectric covering on at least one of said electrodes to insulate said one of said electrodes from said fuel during treatment;

(d) fluid connection means at opposite ends of said outer electrode and communicating with said treater region, one of said fluid connection means being for connection to said fuel source and the other of said fluid connection means for connection to said engine;

(e) a plurality of dielectric particles positioned within said treater region;

(f) means retaining said dielectric particles within said treater region;

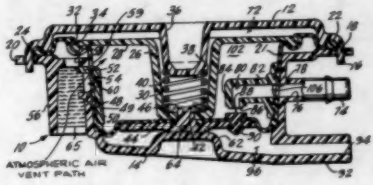
(g) high voltage supply means connected to said electrodes to provide a high intensity electric field between said electrodes within said treater region for treatment of fuel flowing therethrough to said engine.

4,373,495

PRESSURE TRANSDUCER FOR EXHAUST GAS RECIRCULATION SYSTEM

Cyril E. Bradshaw, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 28, 1980, Ser. No. 211,814
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **15 Claims**



1. A pressure transducer for an internal combustion engine exhaust gas recirculation (EGR) system, said system having fluid lines connected to a carburetor venturi vacuum port, an EGR control valve, a ported manifold vacuum port in said carburetor, and a control pressure signal source, said transducer comprising,

(a) housing means, said housing means including structure defining a cavity therewithin;

(b) pressure responsive means disposed within said cavity, said pressure responsive means including a resilient diaphragm connected around the outer periphery thereof to said housing means;

(c) means for effecting a seal between said diaphragm and said housing means along a surface radially inwardly from the outer periphery thereof for dividing said diaphragm into outer and inner pressure responsive portions;

(d) reaction plate means connected to said diaphragm outer portion and said diaphragm inner portion for maintaining a spaced relationship therebetween and for movement therewith;

(e) means for biasing said reaction plate means and said diaphragm inner portion in one direction;

(f) said housing means, said diaphragm outer portion, and said reaction plate means cooperating to define a vacuum chamber;

(g) said reaction plate means and said diaphragm inner portion cooperating to define a vent chamber;

(h) said inner diaphragm portion and said housing means cooperating to define a control pressure chamber;

(i) said housing means including,

(i) means defining a vent port for communicating atmospheric air to said vent chamber;

(ii) means defining a fluid pressure signal output port adapted for connection to said EGR control valve line;

(iii) means defining a first vacuum signal supply port adapted for connection to said ported manifold vacuum line and in fluid communication with said vent chamber, and

(iv) means defining a second vacuum signal supply port adapted for connection to said carburetor venturi vacuum line; and

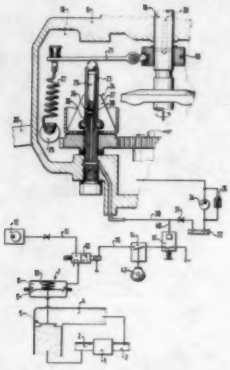
(j) means defining a valve seat disposed in said vent chamber and a valve surface movable with said reaction plate means toward and away from said valve seat, for regulating the fluid pressure at said output port means in response to pressure changes in said control chamber, vent chamber and vacuum chamber.

4,373,496

APPARATUS FOR CONTROLLING AN EXHAUST RECIRCULATION DEVICE IN INTERNAL COMBUSTION ENGINES

Max Greiner, Gerlingen; Klaus Krieger, Affalterbach, both of Fed. Rep. of Germany; Gottfried Schiller, Chicago, Ill.; Wolf-Rüdiger Walk, and Ludwig Walz, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 206,594
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—569 **30 Claims**



1. In combination with an exhaust gas recirculation device and a governor spring adjusting lever of a fuel injection pump of an internal combustion engine, said exhaust gas recirculation device including an exhaust gas recirculating line, an exhaust gas throttle device disposed in the exhaust gas recirculating line and an exhaust gas adjusting device disposed to actuate the exhaust gas throttle device, an improved apparatus for controlling the exhaust gas recirculating device, comprising:

switching means connected to the exhaust gas adjusting device;

control means connecting the switching means to the governor spring adjusting lever, and being responsive to the setting of the governor spring adjusting lever such that;

(a) said switching means actuates the exhaust gas adjusting device causing the exhaust gas throttle means to open thereby permitting exhaust gas recirculation for all settings of the governor spring adjusting lever less than a predetermined setting; and

(b) said switching means actuates the exhaust gas adjusting device causing the exhaust gas throttle means to close thereby blocking exhaust gas recirculation for all settings of the governor spring adjusting lever greater than a predetermined setting.

4,373,497

EXHAUST GAS RECIRCULATION CONTROL

Glen C. Hamren, Greentown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1981, Ser. No. 303,949
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **3 Claims**

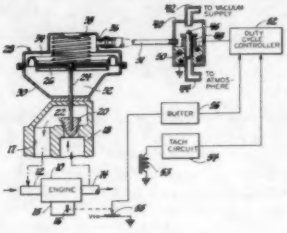
1. In combination with a fuel injected internal combustion engine having an air induction passage through which air is inducted into the engine, an exhaust discharge passage, and a fuel injection pump including a variable position fuel control element for controlling the quantity of fuel injected per engine revolution, an exhaust gas recirculation control system for variably controlling the amount of exhaust gas recirculated in accord with the quantity of fuel per revolution between a maximum amount at a first predetermined quantity of fuel per revolution and a minimum amount at a second predetermined quantity of fuel per revolution, comprising:

an exhaust gas recirculation means effective to recirculate exhaust gases from the exhaust gas discharge passage to the air induction passage;

means effective to measure the engine speed;

means effective to measure the position of the fuel control element, the fuel control element positions providing the first and second predetermined values of fuel quantity per revolution each changing at different rates as a function of speed throughout at least a major portion of the speed range of the engine;

means effective to adjust the amount of exhaust gases recirculated through the exhaust gas recirculation means in response to the average value of a control signal; and



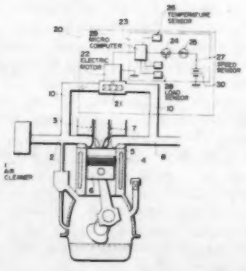
means effective to vary the average value of the control signal between minimum and maximum values in response to variations in the position of the fuel control element, the rate of change of the average value of the control signal with varying positions of the fuel control element varying with engine speed inversely to the change in the range of positions of the fuel control element between the positions producing the first and second predetermined fuel quantities for each revolution, whereby the relationship between the exhaust gas recirculation amount and the quantity of fuel injected for each revolution is maintained substantially constant over the speed range of the engine.

4,373,498

EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shoji Ushimura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 20, 1980, Ser. No. 151,574
Claims priority, application Japan, May 22, 1979, 54-62269
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **3 Claims**



1. An exhaust gas recirculation system for an internal com-

bustion engine comprising an intake passage and an exhaust passage, said system comprising:

a recirculation passage communicating between the exhaust passage and the intake passage; and

means disposed in the recirculation passage for impelling exhaust gas from the exhaust passage of the engine to the intake passage along the recirculation passage,

said impelling means including a blower or compressor for forcing a flow of exhaust gas, an electric motor for driving the blower or compressor, and means for controlling the motor.

4,373,499

VENTILATION CHECK VALVE FOR INTERNAL COMBUSTION ENGINES

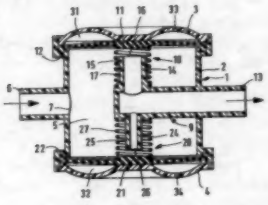
Lothar Bendig, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 295,007

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032243

Int. Cl.³ F02M *27/00*

U.S. Cl. 123—574 **9 Claims**



1. A suction-limiting check valve adapted for use in a pollutant ventilation line of an internal combustion engine which supplies negative pressure of differing levels to the ventilation line, as when the engine crankcase is to be ventilated into the engine intake duct downstream of the carburetor throttle, the check valve comprising in combination:

a valve housing enclosing a valve chamber, the valve housing having an inlet connectable to a space which is to be ventilated and an outlet connectable to a source of variable negative pressure;

first and second diaphragms forming hermetic flexible wall portions of the valve chamber, each diaphragm being circumferentially restrained and having at least a major portion of its outer surface exposed to atmospheric pressure;

first and second diaphragm biasing means applying a bias force to the respective diaphragms in opposition to the atmospheric pressure on their outer surface;

first and second diaphragm abutment means limiting the outward deflection of the respective diaphragms by the diaphragm biasing means, thereby defining diaphragm rest positions; and

first and second valve sockets communicating with the valve housing outlet and defining first and second valve mouths facing a central portion of the inner surface of the respective diaphragms, at an opening distance from the diaphragms in their rest position; and wherein

the first and second diaphragms and their respective biasing means and abutment means cooperate with the first and second valve mouths to form first and second valve devices in a parallel-operating relationship, each valve device responding independently to changes in the negative pressure in the valve chamber and in the housing outlet by closing at a predetermined level of increasing negative pressure in the valve chamber and by reopening at predetermined combined levels of decreasing negative pressure in the valve chamber and in the housing outlet, whereby the closing pressure level in the valve chamber differs from the reopening pressure level as a function of the area of the valve mouth and the level of negative pressure in the housing outlet;

the closing and reopening responses of the first and second valve devices; as determined by their respective diaphragms, diaphragm biasing and abutment means and the opening area and opening distance of their respective valve mouths, are unequal with regard to the levels of negative pressure in the valve chamber.

4,373,500

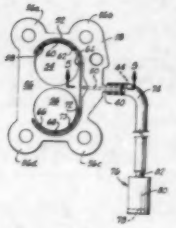
CARBURETOR AIR INJECTION SYSTEM

Louis E. Haynes, 302 S. 6th, Union City, Tenn. 38261

Filed Sep. 25, 1981, Ser. No. 305,791

Int. Cl.³ F02M *23/04*

U.S. Cl. 123—587 **1 Claim**



1. A carburetor injection system for reducing the suction developed by an intake manifold and for reducing the amount of heat transferred between an intake manifold and a carburetor, comprising:

a downdraft carburetor including at least one barrel:

an internal combustion engine including a plurality of spaced cylinders and an intake manifold communicating with said cylinders for charging a combustible mixture of fuel and air to said cylinders;

an automatic choke vlave in at least one barrel of said carburetor;

a flat, substantially rectangular air injector plate sealingly positioned between a carburetor and the intake manifold and including at least two fuel passage ports through the plate, said plate having:

a single auxiliary air inlet port extending through one edge of said plate and opening internally of said one edge along a part of one side of said plate which is closest to said intake manifold and said auxiliary air inlet port having a diameter between 3/64ths inch and 3/32nds inch, said diameter being non-varying throughout the length of said port;

air passageway means disposed in said one side of said air injector plate for conveying auxiliary air from said air inlet port to said fuel passage ports, said air passageway means comprising:

a curvilinear groove having a first semi-circular portion of uniform cross-sectioned configuration extending substantially halfway around a first one of said two fuel passage ports and also having a second semi-circular portion extending substantially halfway around a second one of said two fuel passage ports;

a capillary passageway connecting said curvilinear groove with said single auxiliary air inlet port so that substantially equal lengths of said curvilinear groove lie on opposite sides of the point of intersection of said capillary passageway with said curvilinear groove to substantially equally distribute to the first and second semi-circular portions air entering said curvilinear groove from said capillary passageway; and

a plurality of substantially equally spaced auxiliary air feed passageways extending radially inward from each of said semi-circular portions to communicate with the periphery of the respective fuel passage port over about 180° of the periphery of said port so that air is distributed evenly to the cylinders of said engine through said intake manifold;

a flexible tubing having a first end connected to said single auxiliary air inlet port and having a second end displaced from said first end;

air filter means, connected to said second end of said tubing, for filtering auxiliary air introduced into said auxiliary air inlet port through said flexible tubing;

a first tar paper gasket positioned between said one side of said air injector plate and said intake manifold;

a second tar paper gasket positioned between said air injector plate and said carburetor; and

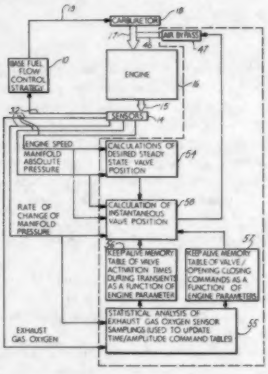
a throttle valve positioned in at least one barrel of said carburetor between said automatic chc'ke valve and said air injector plate.

4,373,501

FUEL METERING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

William G. Rado, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 17, 1981, Ser. No. 303,273
Int. Cl.³ F02D 9/02
U.S. Cl. 123—589 **2 Claims**


CARBURETOR
AIR BYPASS
BASE FUEL FLOW CONTROL STARTER
ENGINE
SENSORS
ENGINE SPEED
MANIFOLD ABSOLUTE PRESSURE
CALCULATIONS OF DESIRED STEADY STATE VALVE POSITION
RATE OF CHANGE OF MANIFOLD PRESSURE
CALCULATION OF INSTANTANEOUS VALVE POSITION
KEEP ALIVE MEMORY TABLE OF VALVE ACTIVATION TIMES DURING TRANSIENTS AS A FUNCTION OF ENGINE PARAMETER
KEEP ALIVE MEMORY TABLE OF VALVE OPENING CLOSING COMMANDS AS A FUNCTION OF ENGINE PARAMETERS
STATISTICAL ANALYSIS OF EXHAUST GAS OXYGEN SENSOR SAMPLINGS USED TO UPDATE TIME/AMPLITUDE COMMAND TABLES
EXHAUST GAS OXYGEN

1. A method for controlling the air-fuel ratio for an internal combustion engine having an air supply passage by prepositioning an auxiliary air supply passage so the auxiliary air supply passage can be controlled to counteract a predicted transient, said method comprising:

generating a stored look-up table to govern the amount of change in the auxiliary air supply passage upon detection of a transient;

detecting a transient;

altering the amount of air flow in the auxiliary air supply passage as a function of the look-up table to maintain a desired air-fuel ratio;

adjusting the air flow in the auxiliary air supply passage to a value suitable for compensating for the next transient;

adaptively updating the table to take into account engine operation conditions by:

(a) sensing an exhaust gas oxygen sensor signal at predetermined intervals;

(b) modifying table values to provide a richer air-fuel average if there are a predetermined number of lean exhaust gas oxygen sensor indications;

(c) modifying table values to provide a leaner air-fuel average if there are a predetermined number of rich exhaust gas oxygen sensor indications; and

(d) producing no modification of the tables if the number of rich and lean indications are within a predetermined number of each other, so that said step of adjusting the air flow includes:

shutting off the auxiliary air passage when the engine is in a heavy cruise mode thereby creating the ability to turn on additional air when needed;

turning on the auxiliary air passage when the engine is in the idle mode so the auxiliary air passage is ready to be shut off under a sudden acceleration;

partly closing off the auxiliary air passage at part throttle steady state operation so as to be able to compensate in either direction; and

wherein the step of detecting a transient includes the step of detecting a minimum value of the rate of change of load at a given engine speed.

2. A fuel metering system for an internal combustion engine, the engine having a passage through which a mixture of air and fuel is introduced into a compression chamber of the engine, the fuel metering system comprising:

a fuel system for controlling the rate at which fuel is metered into the engine's intake passage;

a secondary path for injecting air into the combustion chamber of the engine and means for modifying the rate at which air passes through the secondary path and to preposition said secondary path to compensate for otherwise rapid changes in the air fuel ratio, said means for modifying the rate at which air is injected by the secondary path including a calculation means to calculate repetitively a value representing a current transfer rate of air through the main passage, a desired air fuel ratio, and an amount of air needed from the secondary path, so that said means for modifying the rate at which air is injected by the secondary path prepositions and said secondary path to be able to counteract a predicted transient;

said calculation means including:

stored look-up tables which are adaptively adjusted to provide settings of the ability of the secondary path to pass air, the adaptive adjustment taking place as a function of engine operating conditions;

a computation means for determining a desired steady state valve position to set the ability of the secondary path to pass air, said computation means receiving as input information an engine load indicating parameter;

a statistical analysis means to analyze an input from an exhaust gas oxygen sensor samplings to update time and amplitude look-up tables governing the change in valve position to set the ability of the secondary path to pass air, said statistical analysis means receiving input information of exhaust gas oxygen sensor sampling and the rate of change of manifold pressure;

memory table means coupled to said statistical analysis means for storing valve activation times during transient as a function of engine parameters;

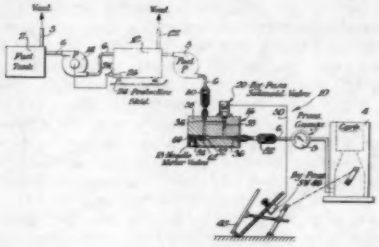
a secondary memory table means of valve opening and closing commands as a function of engine parameters, said keep-alive second memory table being coupled to said statistical analysis means; and

a second computation means for calculating the instantaneous valve position, said calculation means being coupled to receive engine speed, manifold absolute pressure, rate of change of manifold pressure, information from said second keep-alive memory table means and information from second computation means of desired steadty state valve position, and having an output coupled to the valve setting ability secondary path to said air.

4,373,502
FUEL CONTROL SYSTEM

Ronald Re, Newark, Del., assignor to Miletech, Inc., Greenville, Del.

Continuation-in-part of Ser. No. 197,695, Oct. 16, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 244,067
Int. Cl.³ E02M 7/22
U.S. Cl. 123—512 **16 Claims**

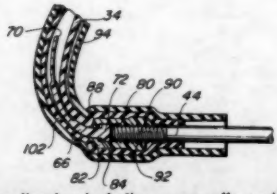


1. In a fuel control system for gasoline-operated motor vehicles having a main storage tank and a fuel pump connected in the fuel line between the main storage tank and the float bowl of a carburetor for feeding gasoline to the carburetor, the improvement being a control system mounted to said fuel line between said fuel pump and said carburetor whereby said control system is adapted to be installed into already existing systems of motor vehicles, said control system including an operating tank mounted to said fuel line downstream from and in flow communication with said main storage tank, vent means for said operating tank, metering means in said fuel line downstream from said operating tank for controlling the rate of fuel flowing to said carburetor, said metering means including a main valve for providing a fixed rate of flow to said carburetor and a selectively operated by-pass valve for providing an increased rate of flow to said carburetor, said main valve and said by-pass valve being mounted in a common housing, said common housing having an upstream inlet line and a downstream outlet line, connecting means connecting said inlet line to an upstream portion of said fuel line between said fuel pump and said housing, and connecting means connecting said outlet line to a downstream portion of said fuel line between said housing and said carburetor.

4,373,503
SLINGSHOT WITH OUTER SLEEVE FOR ELASTIC BAND PROTECTION

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Co., Columbus, Nebr.

Filed Oct. 13, 1977, Ser. No. 841,824
Int. Cl.³ F41B 7/00
U.S. Cl. 124—20 R **4 Claims**



1. In a slingshot including a generally upright handle, rod means for securing missile-projecting elastic band means to said handle, fastening means for attaching said rod means to said handle, elastic band means for projecting a projectile, said rod means terminating in hook elements having rearwardly directed free ends for attachment of said elastic band means thereto over each of said ends of said hook elements,

the improvement comprising:

flexible and resilient tube means for protecting said elastic band means from fold-over fatigue and wear due to forward displacement of said band means and pivotal fold-over thereof about said ends of said hook elements upon elastic release and recoil of said band means in projecting a projectile,

said tube means being sleeved over said elastic band means coaxially therewith along a lineal sector overlying a zone of attachment of said band means to said hook elements,

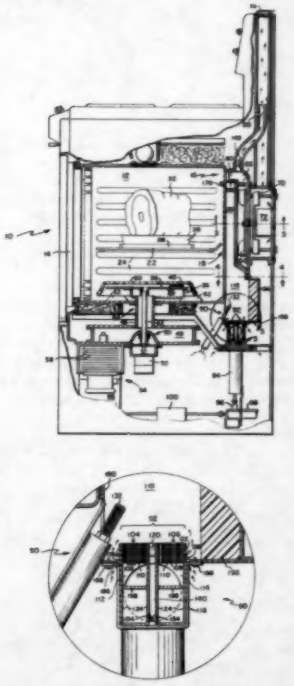
said tube means being in contiguous, embracing contact with said elastic band means in said zone of attachment thereof to said hook elements and extending rearwardly of said ends of said hook elements, and

said tube means being a flexible bend-limiting restraining element to obviate sharp reverse folding of said elastic band means upon distention and release of the stretched elastic band means in projecting a projectile.

4,373,504
GAS BURNER CONVECTION OVEN

William J. Day, Allentown, Pa., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 4,007, Jan. 16, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,413
Int. Cl.³ F24C 15/32; A21B 1/00
U.S. Cl. 126—21 A **2 Claims**



1. A convection oven comprising:

a substantially rectangular oven cavity having a front access door;

a blower system positioned behind the rear wall of said cavity for circulating vapor through said cavity;

means for supplying heat to said vapor comprising a burner

positioned behind said rear wall below the vapor input to said blower system;

said burner comprising ribbons of corrugated metal separated by flat metal ribbons defining primary fuel-air ports, each of said primary fuel-air ports being separated by fewer than four intervening fuel-air ports from a source of secondary air; and

said blower system drawing a primary fuel-air mixture through said fuel-air ports and drawing secondary air from said source of secondary air.

4,373,505

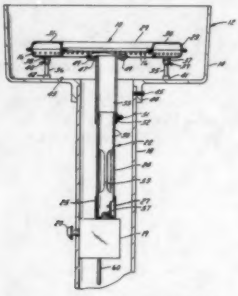
ADJUSTABLE VENTURI TUBE ASSEMBLY FOR A GAS BARBECUE GRILL

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Continuation-in-part of Ser. No. 940,215, Sep. 7, 1978, Pat. No. 4,267,816. This application Mar. 3, 1981, Ser. No. 239,999

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—39 E **13 Claims**



1. An improved gas venturi tube assembly for a gas burner element comprising:

a tubular member defining at least one lateral aperture;

an air regulator member slidably received by said tubular member at one end thereof to controllably cover said lateral aperture;

an opening defined by said regulator member adapted to receive a gas supply nozzle;

a gas intake conduit having an end for operative association with said burner element at one end and in telescoping relationship with said tubular member at the other end; and

adjustable securing means operatively associated with said tubular member and said intake conduit to secure said conduit and said tubular member in a fixed position.

4,373,506

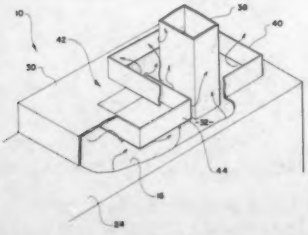
STOVE WITH CO-AXIAL VENT AND FLUE DESIGN

James R. Hyatt, Rte. 1, Box 267-A, Clarkton, N.C. 28433

Filed May 8, 1980, Ser. No. 148,187

Int. Cl.³ F24B *3/00, 7/00*

U.S. Cl. 126—67 **2 Claims**



1. A forced air stove having a unique co-axial flue and vent design for effectively capturing heat around the firebox and the flue extending therefrom, comprising: a rectangular firebox having a surrounding wall including a generally horizontal top structure and adapted to receive and burn combustible fuel material such as wood and coal therein; access door means operatively associated with said firebox for gaining access thereto; an outer wall structure disposed outwardly of the wall structure of said firebox over a substantial area of said firebox for defining an air passageway therebetween where the defined air passageway acts to channel air around the firebox when material is being burned therein such that the heat from the material being burned may be transferred to the passing air; said outer wall structure having a top including a horizontally disposed top portion that extends generally parallel to said top of said firebox; fan means operatively associated with said stove and communicatively connected with said defined air passageway for generating a system of air and forcing the same through said air passageway; flue means communicatively connected to the top of said firebox and extending therefrom through the air passageway defined exteriorly of said firebox and on through the plane of the top portion of said outer wall structure overlying the top of said firebox wherein flue gases resulting from the combustion within the firebox may pass therethrough; a vent opening formed in the top portion of said outer wall structure around the upwardly extending flue; vent means disposed outwardly of and around said flue and communicatively connected to the vent opening and said air passageway and connected to and extending from the top portion of the outer wall structure in co-axial relationship with said flue means such that heat being exhausted by said flue means must pass in close heat exchange relationship with flue gases passing from said firebox through said flue means, and wherein said co-axial relationship between said flue means and said vent means assures that the air passing through one must pass within the other although in separate relationship; humidifier means operatively associated with said stove and generally disposed in association with said defined air passageway for transferring moisture to the heated air passing therethrough, said humidifier means including a water container disposed within said defined air passageway in the path of the passing air wherein the water container acts to transfer moisture to the passing heated air and wherein said water container is oriented transverse to the general direction of air flow within said defined air passageway and vertically spaced over the passing air flow such that the passing air flow is constrained to pass thereunder after which the air flow may turn approximately 90 degrees and move up one side of the water container and on up adjacent the open top thereof.

4,373,507

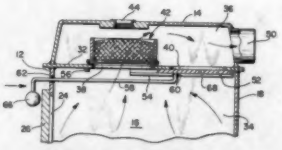
STOVE CONSTRUCTION

Larry A. Schwartz, Warwick; Robert Gelter, Coventry, and Peter S. Albertsen, Quidnesset, all of R.I., assignors to Jamestown Group, Providence, R.I.

Filed Oct. 9, 1980, Ser. No. 195,399

Int. Cl.³ F23V *15/00*; F23L *11/00*

U.S. Cl. 126—289 **8 Claims**



1. A stove comprising front, rear, top, bottom and side walls, a door on said front wall movable between a closed and open position to permit access to the stove interior, a substantially horizontal partition in said stove located in spaced relation to but adjacent said top wall defining a relatively large combustion chamber therebelow and a relatively small afterburn

chamber thereabove, an exhaust duct communicating with said afterburn chamber and draft means communicating with said combustion chamber, said partition having two openings therein, a catalytic converter mounted on said partition in registry with one of said openings whereby all gases passing through said one opening pass through said converter, damper means movable between a first position wherein said one opening is unobstructed and said other opening is substantially blocked, and a second position wherein said other opening is unobstructed and said one opening is substantially blocked, and handle means operable from outside the stove to move said damper between said first and second positions, said handle means blocking opening movement of said door when said damper is in its said first position, whereby said door can be opened only when said damper has been moved to its said second position.

4,373,508

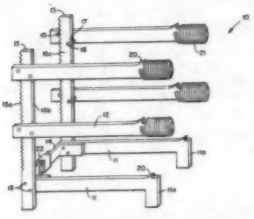
ADJUSTABLE MEANS FOR SUPPORTING COMBUSTIBLE MATERIAL

Richard D. Northcraft, Rte. 3, Box 450, Escondido, Calif. 92025

Division of Ser. No. 84,621, Oct. 12, 1979, abandoned. This application Jun. 19, 1981, Ser. No. 275,371

Int. Cl.³ F23H *13/00*

U.S. Cl. 126—298 **8 Claims**



1. In an andiron for supporting combustible logs, said andiron having a base portion, at least one vertical member projecting upwardly from said base portion, at least one lateral member adjustably supported on one side of said vertical member, there being spaced abutment members projecting from one side of each lateral member towards and frictionally engaging opposite edge portions of one of said vertical members to hold said lateral member in a selected position of adjustment on said vertical member, the spacing between said abutment members being greater than the spacing between said opposite edge portions of said vertical member such that upward swinging movement of said lateral member about one of said abutment members releases said frictional engagement to permit vertical movement of said lateral member along said vertical member, the improvement wherein one of said abutment members engages said vertical member only on the edge portion thereof opposite that with which the other abutment member is in engagement, said other abutment member being formed with shoulder means in overlapping engagement with a surface portion of said vertical member on the side thereof opposite said lateral member when said lateral member is in said selected position to thereby prevent relative separating movement of said vertical and lateral members, said shoulder means being spaced from the other of said abutment members a distance greater than the spacing between said opposite edge portions of said vertical member such that said upward swinging movement of said lateral member about the longitudinal axis of the abutment member in engagement with only the edge portion of said vertical member permits movement of said shoulder means out of said overlapping engagement with said vertical member surface portion to thereby permit relative separating movement of said vertical and lateral members.

4,373,509

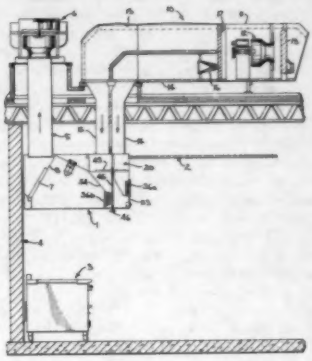
HIGH EFFICIENCY VENTILATION SYSTEM

Emery W. Neitzel, Rothschild, and Jerome A. Schumacher, Wausau, both of Wis., assignors to Greenheck Fan Corporation, Schofield, Wis.

Filed Oct. 20, 1980, Ser. No. 198,588

Int. Cl.³ F21C *15/08;* **F23J** *11/00*

U.S. Cl. 126—299 D **9 Claims**



1. A ventilation system for a room which comprises:

a make-up air supply system including an inlet duct, a fan for supplying a substantially constant volume of fresh air to the inlet duct, a tempered air duct connected to the inlet duct and including means for conditioning air flowing therethrough, and a fresh air duct connected to the inlet duct;

a hood disposed within the room and having a fresh air register coupled to the fresh air duct and positioned to direct fresh air beneath the hood and having a tempered air register coupled to the tempered air duct and positioned to direct tempered air into the room, the hood also including damper means for changing the relative amounts of air flowing through the tempered air register and the fresh air register without changing the combined amount of air flowing through both of said registers; and

an exhaust system having an exhaust duct coupled to the hood and an exhaust fan for withdrawing a substantially constant amount of air from beneath the hood through the exhaust duct.

4,373,510

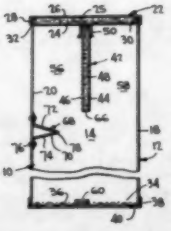
VENTING SYSTEM FOR OIL OR GAS-FIRED APPLIANCES

Donald L. Smith, 452 Nassau Ave., Bolingbrook, Ill. 60439

Filed Apr. 17, 1980, Ser. No. 141,261

Int. Cl.³ F23J *11/00;* **E04F** *17/04*

U.S. Cl. 126—307 A **5 Claims**



1. In combination with an oil or gas-fired appliance having a

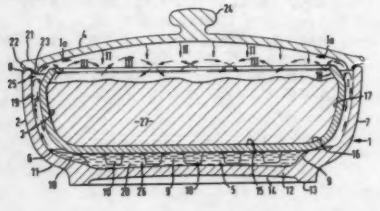
base, an upper portion and having a combustion chamber provided with a plurality of burners each having a flue leading to a collection box within the appliance and a flue outlet disposed in the upper portion for the outlet passage of combustion gases from the collector box to be conveyed to a chimney flue for the appliance: a venting system for the collector box of the combustion chamber comprising a first piping for the outlet of combustion gases from the collector box connected to the flue outlet, a second piping connected to the chimney flue, an elongate diverter box disposed in the path of the combination gases between the collector box and the chimney flue and vertically arranged exteriorly of the appliance and having a first and second set of opposing vertical walls and having an upper portion with a top wall and a lower portion, a heat resistant baffle depending from the top wall and sealingly transversely extending between the walls of one set of walls parallel with the walls of the second set and centrally disposed between the walls of the second set to divide the upper portion of the interior of the diverter box into a flue gas inlet section with which the first piping communicates and a vent gas outlet section with which the second piping communicates, said diverter box having a bottom in its lower portion provided with a substantial opening disposed well above the base of the appliance with said opening being at least at or above the horizontal level of the burners and in constant free communication with the atmospheric air surrounding the appliance which air enters the diverter box through the opening in the bottom to establish a thermal barrier, said baffle having a free lower end terminating a substantial distance above the opening in the bottom and a turning vane positioned slightly below the free lower end and carried by the wall of the second set on the flue gas inlet side of the baffle so that flue gases flowing downwardly in the flue gas inlet section impinge on the vane and are turned immediately under the lower end of the baffle to flow upwardly in the vent gas outlet section with the cold air entering through the opening in the bottom establishing a thermal barrier to slow down the speed of the hot gases in the flue gas inlet section, and with the baffle forming a heat lock in the combustion chamber to prevent heat waste through the chimney flue and with said turning vane being downwardly sloped from the carrying wall and having a free tip disposed below the free end of the baffle and between its carrying wall and the baffle.

4,373,511

COOKING VESSEL

Derek A. Miles, and Julie M. T. Miles, both of Quinta da Pena Rau da Pena, 4100 Porto, Portugal

Filed May 27, 1980, Ser. No. 153,606
Int. Cl.³ F24D *1/00*
U.S. Cl. 126—369 **15 Claims**



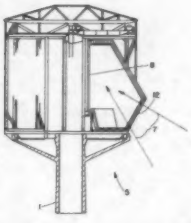
1. A cooking vessel for oven cooking comprising an outer vessel to contain a quantity of water, an inner vessel to contain foods, and a lid to close said outer vessel, wherein said outer vessel is formed with a well at its lower end, support means are provided in said outer vessel for supporting said inner vessel above said well with the outer face of a sidewall of said inner vessel spaced inwardly from the inner face of a sidewall of said outer vessel to provide an annular gap and with passages communicating said well with said annular gap; said inner vessel and said outer vessel and said lid are relatively so shaped and located one within another as to form therebetween a space of which space said annular gap forms a part; said inner vessel and said lid are relatively so shaped and disposed as to form a further space therebetween above food contained in said inner vessel; and wherein, when said cooking vessel is heated in an oven, a controlled release, circulation and re-condensation of water vapor from said water contained in said outer vessel occurs in said space and a controlled release, circulation and re-condensation of further water vapor from said food contained in said inner vessel occurs in said further space, with relatively little mixing of said water vapor and said further water vapor and without undue loss of said water vapor from said cooking vessel, after initial heating of said outer vessel and lid in the oven.

4,373,512

METHOD AND APPARATUS FOR PROTECTING AN ARRANGEMENT LOCATED IN AN AREA OF HIGHLY CONCENTRATED RADIATION

Alfred Hirt, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 230,102
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004582
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—418 **10 Claims**



1. In a method for protecting an arrangement located in a region of highly-concentrated radiation, including a solar radiation receiver of a field of solar heliostats, the improvement comprising in diffusing radiation in the path of radiation directed towards the arrangement by directing a radiation diffusing fluid into said path of radiation such that the fluid itself causes diffusion of the radiation in said path.

9. Device for protecting an arrangement located in a region of highly-concentrated radiation, said arrangement comprising an apertured receiver of a gas tower-solar tower project having a heat exchanger unit and a hot gas turbine connected thereto; a firing or spraying device being located in the upper region of the gas tower supporting the receiver or on the receiver, said firing or spraying device being adapted to direct a smoke producing medium or water vapor into the path of radiation between a controlled heliostat system and the receiver.

4,373,513

HIGH-EFFICIENCY NON-TRACKING SOLAR COLLECTOR DEVICE

Peter Materna, 943 Lanning Ave., Lawrenceville, N.Y. 08648

Filed Jun. 17, 1980, Ser. No. 160,552
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—422 **15 Claims**

1. A radiant energy receiver operable between minimum and maximum operating temperatures, comprising:

a plurality of fluid conductors of predetermined crosssectional area, thermally isolated from each other and presenting parallel paths to a common flow input;

a fluid disposed in said plurality of fluid conductors having a negative thermal coefficient of viscosity such that the viscosity of said fluid changes at least by a factor of 5 in response to said fluid being heated and cooled between the minimum and maximum operating temperatures of said receiver, said fluid having minimum and maximum viscosities at the maximum and minimum operating temperatures of said receiver, respectively:

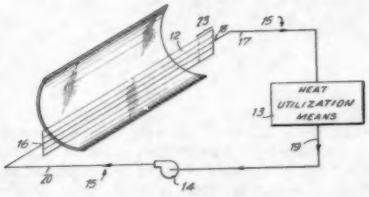
successive ones of said plurality of fluid conductors receiving radiant energy with others of said plurality of fluid conductors remaining unenergized, depending upon the time of day and time of year;

energy utilization means in thermal communication with said fluid;

means for circulating said fluid through said ones of said fluid conductors and said energy utilization means;

said fluid acting as a valving means responding to said fluid being heated and cooled to permit the flow of said fluid through said successive ones of said plurality of fluid conductors receiving radiant energy, and to stop the flow of said fluid through said others of said plurality of fluid conductors remaining unenergized.

2. A high efficiency non-tracking solar collector device



comprising an elongate concentrator means configured to concentrate incident light along a band extending parallel to the axis of said reflector, the transverse position of said band varying as a function of the incident angle of light on said reflector, a collector assembly having a receptor surface spaced from said reflector in accordance with the focal length of said reflector, said surface having a longitudinal extent substantially coincident with the lenth of said band and a lateral extent substantially coincident with the extreme positions assumed by said band responsive to the impingement of useful incident light on said collector, characterized in that said collector assembly defines a liquid container bounded by and in heat conductive relation to said receptive surface, said container being divided into a plurality of side-by-side abutting flow passages extending parallel to the axis of said reflector, an entrance and an exit manifold formed on said container, each said manifold communicating with all said passages, pump means for circulating liquid from said entrance to said exit manifold through said passages and a liquid in said system subject to viscosity changes in the range of temperatures encountered in said collector assembly whereby the viscosity of fluid in the respective passages is a function of the temperature of the liquid therein and, accordingly, the flow rate is maximized through the hottest said passages.

4,373,514

DEVICE FOR COLLECTING, TRANSMITTING AND USING SOLAR ENERGY

Lambros Lois, 6104 Dunleer Ct., Bethesda, Md. 20034

Filed Apr. 2, 1980, Ser. No. 136,612
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 **17 Claims**

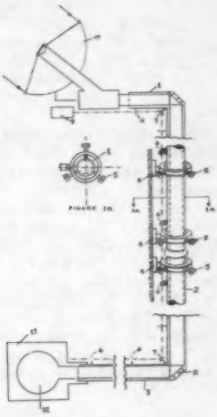
1. A transmission device for transmitting a beam of collimated solar energy from a solar energy collector/concentrator/collimator to an associated solar energy use or storage device, said beam having a propagation axis defined by the line formed by the center of said beam along its direction of travel, said transmission device comprising:

a plurality of modular, interconnected solar energy transmission tubes, said plurality of tubes having a transmission axis defined by the interconnection of the longitudinal axes of said tubes,

each tube having walls smooth and highly reflective to solar radiation,

at least one tube being an angled tube wherein the walls thereof form an angle at at least one position thereof whereby the longitudinal axis of said angled tube is changed in direction by the same angle at said position; and said angled tube having an interior beam diverting means, located inside at said position, whereby the direction of radiation propagating along the longitudinal axis of said angled tube is changed by said angle at said position,

each non-angled tube having an alignment sight disposed on its exterior at each end such that a line drawn through the



center of said sights will be parallel to the longitudinal axis of said tube, and each angled tube having an alignment sight disposed on its exterior at each end and also having an external beam diverting means disposed on its exterior at the position of said angle such that light propagating parallel to the longitudinal axis of one side of said angled tube and passing through the sight disposed on the end of the same side will be diverted at said external beam diverting means to propagate along a direction parallel to the longitudinal axis of the other side of said angled tube and pass through the sight disposed at the end of said other side; said sights providing means by which said transmission axis of said plurality of tubes can be aligned to essentially coincide with said beam propagation axis

wherein at least one of said modular tubes is provided with longitudinally parallel, exterior fins by which heat is dissipated from said tube.

4,373,515

SOLAR COLLECTOR

Raleigh F. Morgan, 461 E. Santan, Chandler, Ariz. 85224

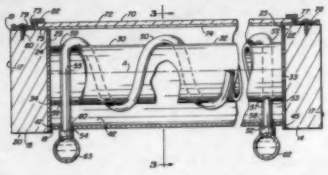
Filed Jul. 31, 1980, Ser. No. 173,955
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 **8 Claims**

1. A solar collection for receiving solar radiation and for utilizing the energy therein to increase the temperature of a fluid medium, said solar collector comprising:

a. a first plurality of hollow cylindrical energy accumulators, each energy accumulator having an outer surface, a portion of said surface being directly exposed to said solar radiation, and each energy accumulator having first and second holes therethrough proximate each end thereof;

b. a second plurality of arcuate reflectors, each reflector spaced from and associated with a different one of said accumulators and having a reflection surface for receiving solar radiation and redirecting said radiation to the surface of its associated accumulator, each of said second plurality of reflectors having a first aperture therethrough at a first end thereof and a second aperture therethrough at a second end thereof;

c. a third plurality of conduits for circulating said fluid medium therethrough, each of said conduits residing in juxtaposition with the surface of an associated one of said first plurality of accumulators, the temperature of said fluid medium being elevated in response to transfer of said



energy from said energy accumulators, each of said third plurality of conduits having a first terminal end portion passing through the holes in the first of its associated collector and through the aperture in a first end of its associated reflector, and having a second terminal end portion passing through the holes in each second end of its associated collector and through the aperture in the second end of its associated reflector;

d. a fluid medium supply line coupled to each of said first terminal end portions of each of said third plurality of conduits for supplying said fluid medium thereto; and

e. a fluid medium outlet line coupled to each of said second terminal end portions of each of said third plurality of conduits for receiving said fluid medium therefrom.

4,373,516

APPARATUS FOR CHIROPRACTIC THERAPY AND MASSAGE

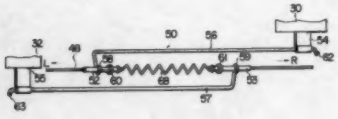
Teruo Masuda, Itaukaichi; Masayasu Morita, Fuchu; Kazuyuki Yamaguchi, Sayama, and Yoshikazu Harada, Akishima, all of Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,647

Claims priority, application Japan, Dec. 27, 1979, 54-180193[U]; Dec. 27, 1979, 54-180194[U]; Apr. 8, 1980, 55-47562[U]; May 15, 1980, 55-64278; May 15, 1980, 55-66578[U]; May 15, 1980, 55-66579[U]

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—57 **14 Claims**



1. An apparatus for chiropractic therapy and massage comprising a housing on which an user may lie, pressure means including a number of pressure rollers disposed in the housing and adapted to roll to apply pressure on the body of the user lying on the housing, a support frame provided in the housing and supporting the pressure means, a pair of pulleys provided in the housing, and a wire stretched between the pulleys to reciprocate the support frame, characterized in that the apparatus further comprises:

means coupled to both ends of said wire for absorbing the elongation and contraction of said wire; and

means coupling both ends of said wire to said support frame for transmitting the driving force of said wire directly to said support frame without transmitting the driving force to said absorbing means.

4,373,517

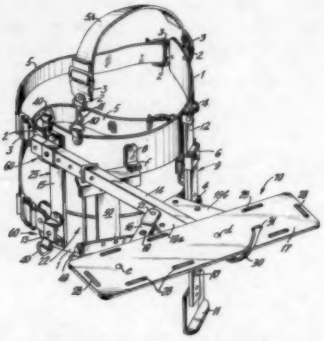
ORTHOPEDIC ARM AND SHOULDER BRACE

James M. Criscuolo, New York, N.Y., assignor to Thomas E. Spath, Brooklyn, N.Y.

Filed Aug. 12, 1980, Ser. No. 177,477

Int. Cl.³ A61B *17/18*

U.S. Cl. 128—75 **7 Claims**



1. In a reversible orthopedic brace device for use on a human being to immobilize and support the arm and shoulder of the wearer consisting of a pair of upper and lower adjustable, generally parallel rigid bands terminating at positions approximating the chest and back of the wearer, and fastening means associated with the bands for mounting laterally the bands on the human torso, the improvement which comprises:

(a) at least three vertically mounted rigid assemblies, the upper and lower ends of which are secured to the upper and lower rigid bands to thereby join the bands in a unitary structure;

(b) a generally horizontal arm support assembly terminating at one end in a pivotally mounted, adjustable horizontal plate adapted to receive and support the forearm of the wearer; and

(c) a vertical hip support bar terminating in a flat L-shaped plate; wherein at least two of the vertically mounted rigid assemblies cooperate to receive and adjustably secure the horizontal arm support assembly, and a third vertically mounted rigid assembly is adapted to receive and adjustably secure the vertical hip support bar to position the L-shaped plate proximate to the hip of the wearer.

4,373,518

METHOD OF DRILLING LIVING BONE

William L. Kaiser, Warsaw, and Gale R. Brown, South Whitley, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Sep. 26, 1980, Ser. No. 191,187

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 EB **1 Claim**

1. In a method for inserting a bone pin through tissue and bone, the improvement comprising:

drilling through said tissue and bone with a bone pin, said bone pin having an elongated cylindrical shaft with a

cutting tip at one end of said shaft, said cutting tip including a semi-cylindrical portion having a flat surface substantially coinciding with the center plane of said bone pin, said semi-cylindrical portion having a proximal end integrally connected to the shaft and a distal end having an angled cutting edge and an angled non-cutting edge converging to form a point,

maintaining the maximum average bone temperature during drilling at a radial distance of 1 mm from the drill site at about 51° C. or less, and maintaining the average duration of temperature elevation above 55° C. at a radial distance of 1 mm from the drill site during drilling at about one second or less; and

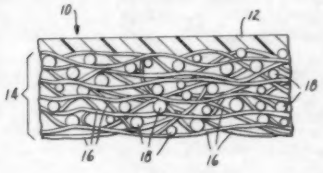
retaining the bone pin in the tissue and bone for a period of time for use with a suitable external fixation device.

4,373,519

COMPOSITE WOUND DRESSING

Louis A. Errede, North Oaks; James D. Stoesz, St. Paul, both of Minn., and George D. Winter, deceased, late of St. Paul, Minn. (by Jenny Upton, personal representative), assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 26, 1981, Ser. No. 277,990
Int. Cl.³ A61L *15/00*; A61F *13/00*
U.S. Cl. 128—156 **18 Claims**



1. A composite wound-dressing which is a sheet material, comprising:

(a) a polytetrafluoroethylene fibril matrix,

(b) 0.5 to 10 parts of hydrophilic absorptive particles per part of PTFE by weight enmeshed in said matrix, the absorptive particles having absorptive capacity greater than 0.5 grams of water per gram of dry particles, and

(c) a partially occlusive film coated on one surface of said matrix,

wherein substantially all of said hydrophilic absorptive particles are unavailable for sloughing.

4,373,520

RESPIRATOR SPEECH UNIT/OUTLET VALVE

Roland H. Arbique, Hull, Canada, assignor to Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, Canada

Filed Aug. 14, 1980, Ser. No. 178,186
Claims priority, application Canada, Sep. 28, 1979, 336600
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—201.19 **8 Claims**

1. A speech transmitting unit for use with a respirator, said respirator including an air inlet and an air outlet, said unit comprising

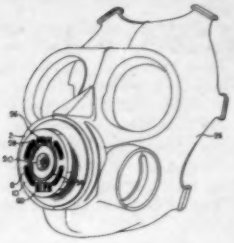
a cylindrical open-ended frame, one end of which is to be connected to said air outlet;

a rigid valve seat disc transversely disposed in said frame adjacent the other end of the frame, providing an air-tight seal between said frame and said valve seat disc;

first and second openings in said valve seat disc, said first opening being in the form of a circular aperture;

a one-way valve associated with said circular aperture to permit the exit of exhaled air from said respirator and to prevent the entry of outside air into said respirator when the wearer thereof is not exhaling;

a speech transmitter disc including a diaphragm, transversely disposed in said frame adjacent said one end of the frame and spaced from said valve seat disc, said transmitter disc being of a diameter somewhat smaller than the diameter of said frame, to define together with said valve seat disc and said frame, a peripheral exhaled air-flow path between said one end of the frame and said circular aperture; an opening in said speech transmitter disc; and



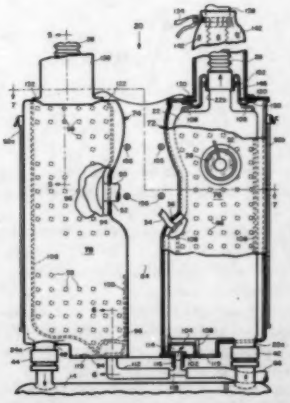
conduit means for connecting said opening in said speech transmitter disc with said second opening in said valve seat disc to provide an outlet path for speech transmission, wherein said valve is in the form of a flexible disc secured at its center to an outer end of the frame, the valve in operative position being concentric with and covering the aperture to cooperate therewith, at least a portion of the periphery of the valve overlapping the edges of the aperture, the valve, when in operation, flexing to permit passage of exhaled air from the respirator through said aperture and then sealing the aperture to prevent entry through the aperture into the respirator of outside air.

4,373,521

HEATED BREATHING BAG SHEATH

J. Frank Wattenbarger, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,398
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—202.13 **10 Claims**



1. A heated sheath devide for use in association with an underwater breathing apparatus of the type including a breathing bag, a breathing hose extending from said bag for connec-

tion of its distal end to a utilization means, and a source of heated water, said sheath device comprising:

fabric wall means defining at least a first breathing bag enclosure;

said wall means comprising at least one wall including inner and outer layers of substantially water impervious fabric, said layers being connected together at a plurality of locations so as to define water flow passages in said one wall;

means for connecting said flow passages to said source of heated water;

at least a first water conducting, elongate sleeve means formed of substantially water impervious fabric having a proximal end connected to said outer layer of said wall means, said sleeve means being adapted to receive said hose and to have its distal end substantially closed about the distal end portion of said hose; and

at least a first dam means extending from said inner layer and adapted to be fixed around the proximal end of said hose so as to direct water flowing from between said layers into the space between said hose and said sleeve means.

4,373,522

EMERGENCY FRESH AIR SUPPLY DEVICE

Allen S. Zien, Bayside, Wis., assignor to Zien Mechanical Contractors, Milwaukee, Wis.

Filed Jul. 31, 1981, Ser. No. 288,909
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—206.12 **11 Claims**

1. An emergency fresh air supply device for people in a building room having an outside wall, comprising in combination:

(a) housing means defining a storage chamber and an air chamber and adapted to be fixedly mounted on the inner side of said outside wall, and with said housing means being openable from the room side,

(b) a fresh air conduit connected to said air chamber of said housing means and adapted to extend outwardly therefrom through the said building wall to form a fresh air inlet mouth on the outer side of said wall,

(c) at least one face mask removably disposed within said storage chamber of said housing means and with said mask being connected to said conduit,

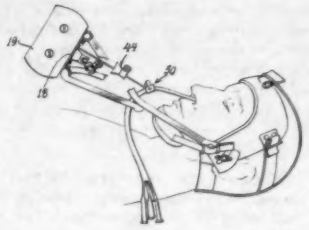
(d) and a closure cap disposed at said inlet mouth of said conduit for normally closing said conduit to outside air.

4,373,523

HELMET MOUNTED CONSTANT TENSION TRACTION DEVICE

Edward J. Treutelaar, 8439 W. Sunnyside Ave., Chicago, Ill. 60656

Filed Oct. 23, 1980, Ser. No. 182,620
Int. Cl.³ A61M *15/08*
U.S. Cl. 128—207.18 **8 Claims**



1. A head-worn esophageal varices tube support having a constant tension traction device carried thereby and providing a connecting cable for attachment to the tube comprising:

(a) a helmet-like structure to be worn on the head of a patient so as to allow full mobility for use,

(b) a bracket extending forwardly from said helmet-like structure for mounting a constant tension traction device in a line substantially the continuation of the patient's nostrils,

(c) a constant tension traction device mounted upon said bracket and providing a retractable cable,

(d) means mounted on said cable of said constant tension traction device and releasably attached to the esophageal varices tube for mounting the same under constant tension after the same has been inserted in the nostrils of the patient, and

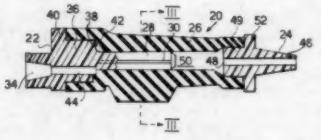
(e) means adjustably fixed along the length of said cable to limit up-riding of the tube out of the patient's nostrils by said constant tension traction device.

4,373,524

LIQUID FLOW CONTROL DEVICES PARTICULARLY USEFUL IN INFUSION ADMINISTRATION SETS

Saul Leibinsohn, 11 Oley Hagardom St., Rishon Le Zion, Israel

Filed May 9, 1980, Ser. No. 148,487
Claims priority, application Israel, May 14, 1979, 57279
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 R **26 Claims**



1. A liquid flow control device particularly useful for attachment to an infusion administration set including an infusion liquid container connected by a line to an infusion needle, comprising: a conical socket member at one end of said device for connecting same to the infusion container side of the line; a conical pin member at the opposite end of said device for connecting same to the infusion needle side of the line; and fixed-rate metering means between and communicating with said socket and pin members for metering the liquid flow therebetween according to a preselected fixed rate; said fixed-rate liquid metering means including a stem integrally formed with one of said conical members, a sleeve overlying said stem,

and a metering groove formed between the outer face of the stem and the inner face of the overlying sleeve which groove meters the liquid flow according to the preselected fixed rate.

4,373,525

METHOD AND APPARATUS FOR DETECTING OCCLUSION IN FLUID-INFUSION TUBE OF PERISTALTIC TYPE FLUID-INFUSION PUMP

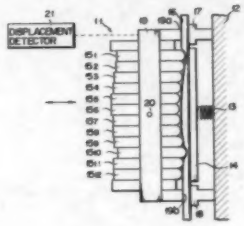
Susumu Kobayashi, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 231,955

Claims priority, application Japan, Feb. 12, 1980, 55/15644

Int. Cl.³ A61M *5/00*; F04B *49/00*

U.S. Cl. 128—214 E **15 Claims**



2. An apparatus for detecting occlusion in a fluid-infusion tube of a peristaltic fluid-infusion pump comprising:

a pair of stationary pieces respectively mounted adjacent said fluid-infusion tube at a fluid inlet portion and a fluid outlet portion of said fluid-infusion pump;

a common movable member having a pair of pressing parts disposed respectively in opposition to said stationary pieces, said pressing parts being adapted to press the parts of said fluid-infusion tube which correspond to said fluid inlet and outlet portion of said pump, with a predetermined substantially equal pressure between said pressing parts and said respective associated stationary pieces during normal fluid infusing, said common movable member being adapted to be displaced corresponding to a change in a first distance between opposite wall portions of said fluid-infusion tube at said inlet portion thereof, and a change in a second distance at said outlet portion thereof, the sum of said first and second distances always being constant, said first and second distances being changed by a change in the internal pressure of said fluid-infusion tube caused by occlusion in said fluid-infusion tube; and

means coupled to said common movable member for detecting said occlusion by detecting said displacement of said common movable member.

4,373,526

DEVICE FOR INJECTION SYRINGE

Lothar Kling, Bierstädter Höhe 24, Wiesbaden, Fed. Rep. of Germany

PCT No. PCT/DE80/00099, § 371 Date Mar. 19, 1981, § 102(e) Date Mar. 19, 1981, PCT Pub. No. WO81/00210, PCT Pub. Date Feb. 5, 1981

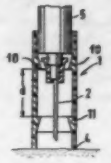
PCT Filed Jul. 8, 1980, Ser. No. 253,925

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2929425

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—215 **14 Claims**

1. Device for injection syringes having a hollow cylindrical body and an exposed injection needle extending below the cylindrical body and connected for flow of liquid from the body through the needle for intramuscular and subcutaneous injections in human or veterinary medicine, which comprises an essentially tubular sleeve of substantially uniform inner diameter, whose inner diameter is slightly larger than the outer diameter of the hollow cylindrical body of an associated injection syringe to permit sliding the sleeve onto the cylindrical body, and which is provided in the interior with at least one clamping- or holding element disposed at an intermediate point to provide an upper portion of the sleeve encircling the cylindrical body and which holding element releases, when a certain pressure is reached, the forward motion of the syringe



body with the needle which is disposed in the sleeve, whereby the length of the sleeve and the position of the clamping element in it are so dimensioned that the needle remains completely in the sleeve before the pressure is applied, and that, after the application of the pressure, the desired depth of injection can be reached outside of the sleeve by a stop element in the sleeve which stops the syringe body which moves toward the end of said sleeve when the desired pressure is reached.

4,373,527

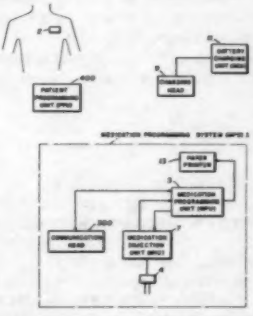
IMPLANTABLE, PROGRAMMABLE MEDICATION INFUSION SYSTEM

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 27, 1979, Ser. No. 34,155

Int. Cl.³ A61M *7/00*

U.S. Cl. 128—260 **642 Claims**



1. A programmable infusion system for providing medication to a living body of a patient comprising:

an infusion apparatus for implantation in said living body, said apparatus including

a medication reservoir for storing selected medication,

means for infusing said selected medication stored in said medication reservoir into said living body, said infusion means having at least one remotely commandable operational characteristic,

command receiver means coupled to said infusion means for receiving command signals, and

means for telemetering operational information pertaining to said infusion apparatus out of said living body;

command source means external to said living body for transmitting said command signals to be received by said command receiver means; and

means for receiving said telemetered operational information external to said living body.

4,373,528

SUCTION BOTTLE FOR SUCKING OUT SECRETIONS FROM WOUND CAVITIES

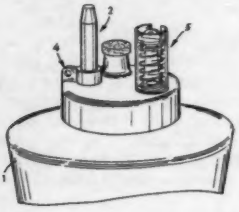
Anton Harle, Munster-Roxel, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,011

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011163

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—276 4 Claims



1. Suction bottle for sucking out secretions from wound cavities with an arrangement for checking the vacuum sealing off a pressure opening in the suction bottle, and with a connecting stub for a suction line, the improvement comprising a return spring (9) for the vacuum indicator arrangement (5), produced from a springy-elastic material, that is supported on the outside of a sealing tube (7) sealing the pressure opening (6) between the top end of the suction bottle (1) and an abutment (8) fixed to the sealing tube which is structured as an indicator arrangement and (7) which is fixed on the one end, in sealing fashion, to the suction bottle (1) and closed off on the other end, and a scale bearer for the vacuum indicator arrangement including stop notches at its top, said bearer cooperating with the abutment.

4,373,529

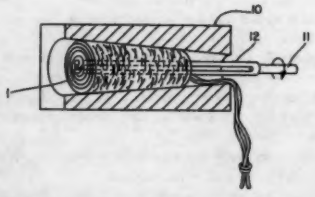
TAMPON WITH WOUND PLEDGET IN THE SHAPE OF A BELL

Amnuey Lilaonitkul, and Richard R. Tews, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 11, 1981, Ser. No. 262,327

Int. Cl.³ A61F *13/20*; D01G *25/00*

U.S. Cl. 128—285 4 Claims



4. A tampon comprising a rolled pledget in the form of a bell shape with raised and depressed areas along the surface, said tampon having a withdrawal string positioned at the head of the bell.

4,373,530

SURGICAL STITCHING INSTRUMENT

Vahe Kilejian, Fresno, Calif., assignor to Lisa Ann Kilejian, Central Point, Oreg.

Continuation-in-part of Ser. No. 137,391, Apr. 4, 1980, abandoned. This application Jun. 29, 1981, Ser. No. 278,980

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R 9 Claims

1. A surgical stitching instrument comprising:

A. a suture holder having a needle receiving slot and aligned notches on opposite sides of the slot adapted to receive a suture therein disposed transversely of the slot, the notches being disposed in a common plane and having an outer open end and a closed inner end;

B. a needle having a sharpened point, an inner edge, an outer edge divergent from the inner edge away from the point, and a hook in the outer edge spaced from the point; and

C. means mounting the holder and needle for relative movement between a retracted position spaced to receive a tissue to be stitched therebetween and a contracted position with the point of the needle in the slot of the holder, the needle being adapted to pierce the tissue disposed therebetween as the needle moves from its retracted position toward the holder, the point being adapted to slide under such a suture in the notches of the holder in movement into the slot, the inner edge of the needle being sharpened to cut the suture in the notches of the holder during such movement of the needle into the slot, the outer edge having a camming surface adapted to cam the suture outwardly of the notches in further movement of the point into the slot, the hook being adapted to snag the suture as it is cammed out of the notches and to drag the suture through the pierced tissue as the holder and needle return to their retracted positions, the outer ends of the notches being disposed in advance of the inner ends thereof in the direction of movement of the needle from the contracted position to the retracted position.

4,373,531

APPARATUS FOR PHYSIOLOGICAL STIMULATION AND DETECTION OF EVOKED RESPONSE

Frederik H. M. Wittkampf; Kornelis A. Mensink, both of Brummen, and Hendrik L. Brouwer, Dieren, all of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

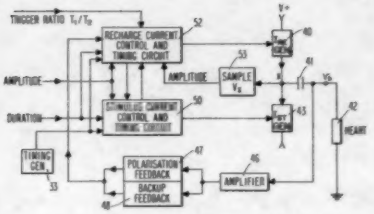
Continuation-in-part of Ser. No. 30,457, Apr. 16, 1979, Pat. No. 4,305,396. This application Feb. 5, 1981, Ser. No. 231,882

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG 17 Claims

1. A pacemaker of the type for delivering pacing stimulus

signals to a patient, having an output to which generated stimulus signals are connected, a timing generator for timing the generation of pacing stimulus signals, output means for generating said pacing stimulus signals and delivering same to said output, sensing means for sensing heartbeat signals from said patient, and logic means connected to said sensing means and said timing generator for controlling generation of said pacing stimulus signals, wherein said output means is characterized by



duration means for generating output signals having three separate durations, said output means having first means for generating a first recharge pulse of a positive polarity and a first duration, second means for generating a stimulus pulse of a negative polarity and a second duration following said first duration, and a third means for generating a second recharge pulse of a positive polarity and a third duration following said second duration, said three pulses together comprising one of said stimulus signals.

4,373,532

ULTRASONIC MARKER FOR PHYSIOLOGIC DIAGNOSIS AND METHOD OF USING SAME

Bruce C. Hill, and Roger A. Stern, both of Palo Alto, Calif., assignors to Palo Alto Medical Research Foundation, Palo Alto, Calif.

Filed Jul. 7, 1980, Ser. No. 166,556
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **6 Claims**

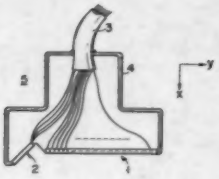
1. A marker for ultrasonic diagnosis comprising a body which provides, upon being subjected to a beam of ultrasonic energy, a reflected, transmitted or scattered acoustic signal distinct from the signal produced by surrounding tissue and means for chronically securing said marker to animal tissue for implantation during surgery, said body comprising an array of balls tangent to a plurality of adjacent balls and attached at the points of tangency, said balls being metallic and fused to each other.

4,373,533

ULTRASONIC DIAGNOSING APPARATUS

Kazuhiro Iinuma, Yaita, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 24, 1981, Ser. No. 237,655
Claims priority, application Japan, Feb. 27, 1980, 55-22670
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—663 **6 Claims**



1. An ultrasonic diagnosing apparatus comprising:
a first transducer array having a plurality of ultrasonic transducers arranged in a given direction for transmitting an ultrasonic beam into a tissue of a human body and for receiving the ultrasonic echo reflected from the tissue;
a second transducer array having a plurality of ultrasonic transducers, for transmitting an ultrasonic beam into the tissue and receiving the ultrasonic echo reflected from the tissue, arrayed in a direction orthogonal to the direction of an array of the transducers in said first transducer array and arranged at an acute angle with respect to said first transducer array in a direction along which the ultrasonic beam of said first transducer array is transmitted and the ultrasonic echo is received;
a first signal processing circuit for processing the ultrasonic echo received by said first transducer array to produce an output signal corresponding to tomogram information of the tissue;
a second signal processing circuit for processing the ultrasonic echo received by said second transducer array to produce an output signal corresponding to a velocity of a blood flow in the tissue;
first display means for displaying a tomogram based on the output signal of said first signal processing circuit; and
second display means for displaying blood flow information based on the output signal of said second signal processing circuit.

4,373,534

METHOD AND APPARATUS FOR CALIBRATING RESPIRATION MONITORING SYSTEM

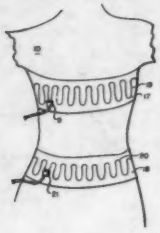
Herman Watson, Miami, Fla., assignor to Respitrace Corporation, Ardsley, N.Y.

Filed Apr. 14, 1981, Ser. No. 254,133
Int. Cl.³ A61B *5/10*
U.S. Cl. 128—725 **2 Claims**

1. In a non-invasive system for measuring respiration volume of the type including: means for providing a signal responsive to a rib cage dimension indicative of rib cage contribution to respiration volume; means for providing a signal responsive to an abdominal dimension indicative of abdominal contribution to respiration volume; means for multiplying said rib cage and abdominal signals by predetermined weighting factors reflecting the relative contributions of said rib cage and abdomen to respiration volume; and means for summing said weighted signals for providing a signal proportional to respiration volume; the improvement comprising means for determining said weighting factors comprising:
alternate means for measuring respiration volume and providing a signal indicative thereof;
means for simultaneously recording said unweighted rib cage and abdominal signals and said signal from said alter-

nate measuring means for a first plurality of breaths based on a first relative contribution between said rib cage and abdomen and for a second plurality of breaths based on a second relative contribution between said rib cage and abdomen;

processing means for (1) dividing said rib cage signal by said signal from said alternate measuring means for each breath



for definig a first coordinate for each breath, (2) dividing said abdominal signal by said signal from said alternate measuring means for each breath for defining a second coordinate for each breath, and (3) determining the x and y intercepts of a line approximation extending through the plurality of points defined by said first and second coordinates, the reciprocals of said intercepts substantially equaling said weighting factors.

4,373,535

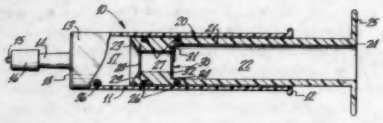
VENTING, SELF-STOPPING, ASPIRATING SYRINGE

Michael D. Martell, 5297 Sandoval Ave., Riverside, Calif. 92509

Filed Aug. 17, 1981, Ser. No. 293,662

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—765 **12 Claims**



1. A syringe assembly comprising:

a tubular body open at one end and being adapted to receive a hypodermic needle at the other end thereof;

a plunger, one end of which is adapted for insertion into said tubular body through said open end, said plunger having a longitudinal passageway for air flow therethrough;

means for forming a fluid-tight seal between the outside surface of said plunger and the inside surface of said tubular body;

an air permeable filter membrane extending across said passageway adjacent said one end of said plunger; and

valve means extending across said passageway between said membrane and said open end of said tubular body for selectively permitting the passage of air through said passageway.

4,373,536

MOBILE CORN HARVESTER

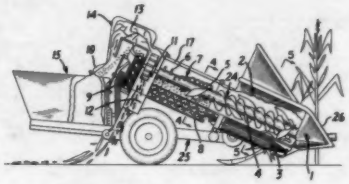
Jose T. da Silva, Ribeirao Preto, Brazil, assignor to Cia Penha de Maquinas Agricolas-Copemsg, Brazil

Filed Jun. 1, 1981, Ser. No. 269,421

Int. Cl.³ A01F *12/18*

U.S. Cl. 130—9 R **6 Claims**

1. A mobile corn harvester comprising a chassis, a casing mounted on said chassis and sloping upwardly toward the rear, a rotor extending longitudinally of said casing and rotatable therein, reaping means at the forward end of said casing for cutting corn stalks with ears thereon and delivering them into said casing, a forward portion of said rotor comprising a cylindrical shaft with a helical vane thereon for separating the ears from the stalks and transporting the ears rearwardly to a thrashing means, said casing having an elongate lower opening through which said stalks are discharged, said thrashing means comprising a cylindrical screen in a rearward portion of said casing and coaxial with said rotor, and a rearward portion of



said rotor comprising a cylindrical shaft and thrashing loops and pins thereon, a lower portion of said casing below said screen forming a trough into which fall kernels of grain passing through said screen, a screw conveyor in said trough for transporting said grain upwardly and rearwardly to a discharge point, and a radial fan at the rear of said rotor and coaxial therewith for drawing waste material rearwardly of said casing and discharging it through an opening in said casing.

4,373,537

GRAIN SEPARATING APPARATUS

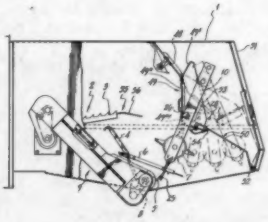
James B. McNaught, St. Germain-en-Laye, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

PCT No. PCT/GB80/00222, § 371 Date Aug. 31, 1981, § 102(e) Date Aug. 31, 1981, PCT Pub. No. WO81/01939, PCT Pub. Date Jul. 23, 1981

PCT Filed Dec. 19, 1980, Ser. No. 297,693

Int. Cl.³ A01F *7/00, 12/00;* B02C *21/00*

U.S. Cl. 130—27 R **11 Claims**



1. Apparatus for recovering grain from a mixture of grain and straw in a combine harvester comprising a conveyor capable of conveying a mixture of grain and straw in a generally horizontal direction to a discharge end; a chute arranged so that said mixture discharged from the conveyor falls onto the chute, the chute having a floor that is imperforate to the passage of grain through it and is downwardly inclined and projects beyond said discharge end in the feeding direction of the conveyor; a trough covered by a grille provided at or adjacent to the lower end of the chute and adapted so that when the mixture of grain and straw passes down the chute grain is collected by the trough and straw passes over it; and a rotor provided above and adjacent to the rear end of the chute and driven so as to assist the discharge of material from the apparatus, characterised in that the rotor (7) is so that it is adjustable towards and away from the chute (4) to vary the

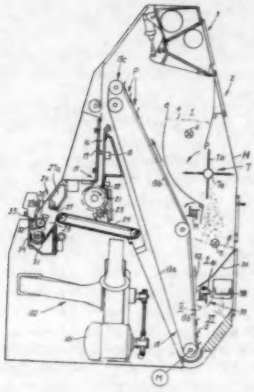
space therebetween for different types of crop and crop conditions.

4,373,538

METHOD AND APPARATUS FOR FORMING A STREAM FROM SEVERAL TYPES OF TOBACCO

Wolfgang Steiniger, Börnsen, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,454
Int. Cl.³ A24C *5/39, 5/14*
U.S. Cl. 131—109 R **23 Claims**



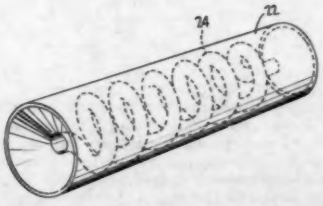
12. In an apparatus for forming a tobacco stream which contains predetermined percentages of plural types of tobacco, the combination of a first source containing tobacco of a first type; a second source containing tobacco of a second type; conveyor means having a plurality of entraining elements defining a series of pockets; means for moving said elements along a predetermined path wherein said elements advance first past said first source to remove therefrom batches of tobacco of the first type, whereby at least some batches contain a surplus of first tobacco, and thereupon past said second source to augment the batches by adding thereto tobacco of the second type; means for removing the surplus of tobacco of the first type from the respective batches intermediate said first and second sources so that each of the batches advancing past said second source at most contains a predetermined maximum quantity of tobacco of the first type; and means for converting the augmented batches into said stream.

4,373,539

TOBACCO SMOKE FILTER

Frank L. Innacelli, 25 Mori Pl., Red Bank, N.J. 07701

Filed Sep. 25, 1981, Ser. No. 305,719
Int. Cl.³ A24D *3/00, 3/02, 3/04*
U.S. Cl. 131—209 **15 Claims**



1. A smoking device comprising a means to hold a tobacco charge having a smoke outlet end, a conventional cellulose filter having an inlet end and a coiled helical tube filled with compressed carbon having an inlet and outlet end portion, said coiled tube placed between said filter and said means to hold the tobacco charge wherein said inlet portion of the coil is directly connected to the outlet of the means to hold the tobacco charge and the outlet portion of the coil is connected to said filter means whereby any tobacco smoke leaving the outlet end of the tobacco charge holding means passes directly into the inlet portion of said coil.

4,373,540

HAIR STRAIGHTENING PROCESS AND HAIR CURLING PROCESS AND COMPOSITIONS THEREFOR

Mario J. de la Guardia, Savannah, Ga., assignor to Carson Products Company, Savannah, Ga.

Division of Ser. No. 805,149, Jun. 9, 1977, Pat. No. 4,304,244. This application Dec. 8, 1980, Ser. No. 214,023
Int. Cl.² A45D *7/00*
U.S. Cl. 424—89 **2 Claims**

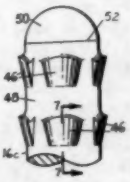
1. A composition for treating hair comprising an effective amount of guanidine hydroxide as the active ingredient, the pH of said composition being at least 11.8, and said composition being applied to said hair and being removed therefrom after a predetermined amount of time.

4,373,541

BRISTLE STRUCTURE FOR BRUSHES AND BRUSH ASSEMBLY

Gary J. Nishioka, 1268 Hemlock, NW., Salem, Oreg. 97304

Continuation-in-part of Ser. No. 64,366, Aug. 7, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,150
Int. Cl.² A45D *44/18*
U.S. Cl. 132—84 R **2 Claims**



1. A brush structure comprising
(a) a head portion,
(b) and multiple bristles mounted on said head portion,
(c) said bristles each having a base end attached to said head portion,
(d) said bristles also each having a shaft portion projecting from said base end and terminating in a tip end,
(e) said bristles being arranged in multiple tufts on said head portion with each of said tufts comprising multiple bristles,
(f) at least some of said bristles having multiple longitudinally extending flat sides joined with each other by cutting edges,
(g) said flat sides and said cutting edges of said bristles extending in uninterrupted relation along the full length of said bristles from said base end to said tip end,
(h) said cutting edges being substantially equally spaced apart along the full length of said bristles,
(i) said bristles being sufficiently rigid to maintain themselves normally in free-standing relation on said head portion but being sufficiently flexible to bend during brushing motions whereby to allow abrasive functioning of the tip ends of the bristles as well as to allow abrasive functioning of said

cutting edges along the shaft portions of said bristles in said tufts.

4,373,542

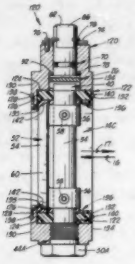
FIRE SAFE DISC VALVE

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129

Division of Ser. No. 865,853, Dec. 30, 1977, Pat. No. 4,249,555. This application Oct. 20, 1980, Ser. No. 198,540

Int. Cl.³ F16K *1/20*

U.S. Cl. 137—72 **18 Claims**



1. A fire safe disc valve, comprising:

a valve body having a flow passageway therethrough and having an annular flow sealing seat, the valve body having a stem operating aperture disposed in a wall thereof and communicating with the flow passageway, and the valve body having an annular stem sealing seat facing the flow passageway and disposed in the stem operating aperture;

an operating stem rotatably supported in the stem operating aperture and having an operating end and a stem engaging end, the operating stem having an annular stem sealing face facing the stem sealing seat;

a disc shaft having a first end portion disposed in the stem operating aperture and a disc supporting portion disposed in the flow passageway, the first end portion of the disc shaft engageable with the stem engaging end of the operating stem so that rotation of the operating stem effects rotation of the disc shaft;

packing means supported by the valve body for providing bearing support for the first end portion of the disc shaft, the operating stem having limited axial displacement toward the stem sealing seat under fluid pressure on the stem engaging end in the event the packing means is destroyed, the packing means characterized as comprising:

a sleeve bearing supported by the valve body in the flow passageway, the sleeve bearing having a pair of diametrally opposed bearing apertures, each of said bearing apertures supporting one end of the disc shaft;

a disc supported by the disc supporting portion of the disc shaft in the flow passageway of the valve body, the disc positionable by rotation of the disc shaft in a passage sealing position and in a passage opening position, the disc having an annular flow sealing face facing the annular flow sealing seat when the disc is in the passage sealing position; and

disc sealing means for sealing the flow passageway between the disc and the annular flow sealing seat when the disc is in the passage sealing position, the disc shaft having limited downstream displacement under the pressure of fluid in the flow passageway in the event the annular stem packer and the disc sealing means are destroyed so that the flow passageway is sealed by sealing together of the annular flow sealing face of the disc and the annular flow sealing seat of the valve body.

4,373,543

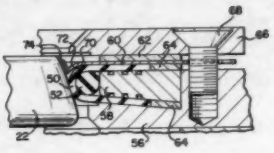
FIRE RESISTANT SEAT FOR FLOW CONTROL VALVE

Robert J. Brown, and Kenneth D. Shepherd, both of Cookeville, Tenn., assignors to The Duriron Company, Inc., Dayton, Ohio

Filed Jun. 12, 1981, Ser. No. 273,165

Int. Cl.³ F16K *1/226*

U.S. Cl. 137—74 **5 Claims**



1. A flow control valve for providing a metal-to-metal seal upon the thermally induced failure of the primary sealing element, comprising in combination: a housing defining a fluid flow channel, a valve element disposed in said fluid flow channel adapted to be moved between an open and a closed position to control the flow of fluid therethrough, an annular resilient seat member circumscribing said fluid flow channel and cooperating with said valve element for sealing said fluid flow channel when said valve element is in a closed position, said annular resilient seat member including a primary sealing element and a resilient reinforcing member supporting said primary sealing element, at least one annular flexible metal seat member having a curved inner edge adapted to sealingly engage said valve disc and positioned adjacent to and biased toward said resilient seat member, and heat resistant gasket means for holding said flexible metal seat member in position so that upon melting or deterioration of said resilient seat member said curved inner edge of said flexible metal seat member springs into sealing engagement with said valve element when said valve element is in a closed position to provide a heat resistant metal-to-metal seal.

4,373,544

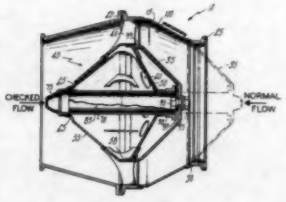
CHECK VALVE

Robert B. Goodman, West Hartford, and James T. Triba, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 191,037, Sep. 25, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,587

Int. Cl.³ F16K *15/06*

U.S. Cl. 137—220 **11 Claims**



1. A fluid check valve comprising:

a housing, defining an outer portion of a fluid channel;

a seat disposed within said housing;

a valve element positionable within said housing by fluid flow therethrough, said valve element, by application thereto of reverse fluid flow, being held in engagement with said seat for closing said check valve and, by application of forward fluid flow thereto, being unseated for opening said check valve; and

an apertured guide body disposed within said housing and defining, with said valve element, under conditions of normal fluid flow, an inner wall of said fluid passage, said apertures accommodating reverse flow therethrough for application of said reverse flow to said valve element for seating said valve element and closing said check valve, said check valve being characterized by:

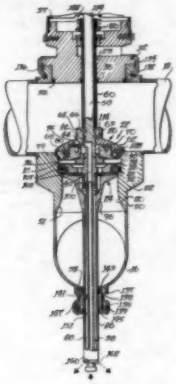
said guide body being mounted within the interior of said housing by a plurality of spaced struts, each of said struts being disposed between said housing and guide body and extending in directions defined by directional components both radially outward from and tangential to said guide body.

4,373,545

DOUBLE BLOCK AND VENT VALVE

Herman E. Knappe, Cedar Rapids, Iowa, assignor to Cherry-Burrell Corporation, Cedar Rapids, Iowa

Filed Jan. 26, 1981, Ser. No. 228,229
Int. Cl.³ F16K *11/20, 51/00*
U.S. Cl. 137—240 **3 Claims**



1. A valve for allowing the separate flow of liquids through two separate lines without intermixing when the valve is in the closed position and for permitting flow between the two lines when the valve is in the open position, which valve comprises

housing means having an internal wall forming an interior passageway therewithin which interconnects a first region designed for connection to a first piping system and a second region designed for connection with a second piping system,

a valve member disposed within said housing

a generally cylindrical rod member extending from an exterior location into an upper end of said housing upon which said valve member is mounted for reciprocating movement, said rod member being adapted for attachment to actuator means disposed exterior of said housing for reciprocating said valve member,

said valve member having a hollow extension stem portion coaxial with said rod member that extends exterior of said housing through the lower end thereof,

said valve member including first and second relatively movable parts, the first part being affixed to said rod member and said second part including a sleeve portion which is disposed in surrounding coaxial relation to said rod member for sliding relative to said rod member and extends through said housing, compression spring means connected to said sleeve portion at a location exterior of said housing for biasing said second valve member part toward said first valve member part so that said parts move relatively toward each other when said rod member reciprocates to open the valve,

said interior passageway wall being formed with first and second annular seats, the diameter of said first annular seat being less than the diameter of said second annular seat,

said first valve member part carrying first ring means for sealing against said first annular seat,

said second valve member part carrying second ring means for sealing against said second annular seat,

tube means located within said hollow stem and extending from a location exterior of said housing to a central passageway within a generally cylindrical spindle portion of said first valve member part, said central passageway having a lower entrance end and upper exit through the sidewall of said spindle portion,

said hollow stem and said tube means forming an annular passageway therebetween,

said first and second valve parts being spaced apart from each other when said valve is in the closed position to create an intermediate chamber therebetween, said second valve member part having passageways communicating said upper exit with said intermediate chamber when said valve is in said closed position, said passageways including constricted nozzle portions, said intermediate chamber extending to said internal wall at a location between said first and said second seats and also extending downward to said annular passageway,

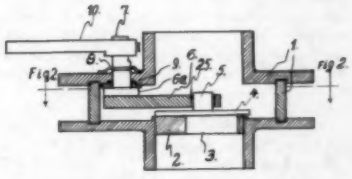
whereby any liquid leaking past either of said ring means drains exterior of said housing through said annular passageway and whereby said intermediate chamber can be cleaned without disassembly by causing cleaning fluid to flow through said constricted nozzle passageway portions and into said intermediate chamber in forceful sprays against the surfaces of said internal wall and out of said housing through said annular passageway.

4,373,546

LONG LIFE VALVE

Rafael Krakovsky, 1022 University Blvd. East, Apt.#322, Silver Spring, Md. 20903

Filed Nov. 26, 1980, Ser. No. 210,786
Int. Cl.³ F16K *29/00*
U.S. Cl. 137—330 **2 Claims**



1. The method of controlling fluid flow in a valve for regulating a variable flow of fluid having valve members including a circular apertureless flat surface disc type closure member movable in sliding registration across a flat surface having therein flow aperture structure to variably restrict the flow path opening size in a manner to extend the operable life of the valve by reducing wear about the disc perimeter edge induced by sliding registration and by fluid flow erosion of the disc peripheral edges comprising the steps of:

mounting the circular apertureless flat surface disc closure member about its geometric center so that it may rotate as it is moved across the flow aperture in sliding registration to open and close a flow path,

providing said flow aperture structure in the valve of an aperture size substantially smaller than the disc for registration therewith,

establishing a flat valve seat surface to receive the flat disc surface in sliding motion thereacross for sealing in place substantially solely by fluid pressure on the disc,

orienting in the valve seat said flow aperture structure with a major portion thereof asymmetrically disposed to one side of the movement path of the center of said disc sufficient to generate a turning movement rotating the disc as it slides into registration by means of the asymmetrical position of the flow path on the rotary disc by reaction of fluid pressure and flow at the aperture while the disc is being moved into or out of registration with the valve seat, and

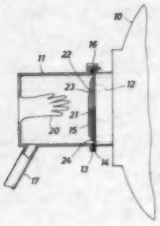
sliding the flat disc surface into and out of registration across the flat valve seat surface to at least partly close the aperture in a mode inducing the random rotational positioning of the disc edge as a function of the fluid pressure and flow to thereby distribute wear induced on the disc edge by fluid flow through the aperture about the entire disc periphery.

4,373,547

DOME FUNNEL

William A. Geis, Woodbridge, and Carl H. Frimodig, Jr., Middletown, both of N.J., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1980, Ser. No. 220,661
Int. Cl.³ F16L *35/00*; B67D *5/00*
U.S. Cl. 137—377 **9 Claims**



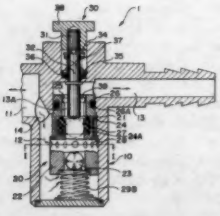
1. Apparatus for removing fluid through a dome hatch of a rolled-over tanker comprising, an open-ended container having a fluid outlet means, means for attaching the open end of the container to the dome hatch, and a flexible mitten extending inwardly of the container to the proximity of the open end.

4,373,548

GAS FLOW SAFETY CONTROL DEVICE

Martin S. Chou, No. 13, Section 2, Kuang Fu Rd., San Chung City, Taipei Hsien, Taiwan

Filed Jul. 8, 1981, Ser. No. 281,342
Int. Cl.³ F16K *17/00*
U.S. Cl. 137—460 **2 Claims**



1. A gas flow safety control device, comprising:

a casing provided with an inlet port to be connected to a gas supply source, a gas compartment connected to said inlet port, an outlet port through which the gas is delivered to a gas burner, said gas compartment provided with a semicylindrical wall having a longitudinal axis;

a cylinder member rotatably coaxially inserted in said gas compartment in said casing, having an inner passage, an upper open end connecting said inner passage to said outlet port, a lower open end connecting said inner passage to said gas compartment, an outer cylindrical surface in contact with said semicylindrical wall of said gas compartment, a plurality of orifices formed in a row around approximately one half of the outer circumference so that when said cylinder member is rotated to dispose said orifices against said semicylindrical wall the orifices are closed, and when said cylinder member is rotated to dispose said orifices opposite to said semicylindrical wall the orifices are exposed to said gas compartment thus connecting said gas compartment with said inner passage;

a ball member capable of freely passing through the lower part of said inner passage of said cylinder member, said ball member being supported by a coil spring so as to be disposed in the lower part of said inner passage of said cylinder member blow said row of orifices;

a throat member fixedly disposed between said upper open end of said inner passage of said cylinder member and said row of orifices in said inner passage, having slightly tapered interior passage which may be closed by traping said ball member when said ball member is pushed upwards from below; and

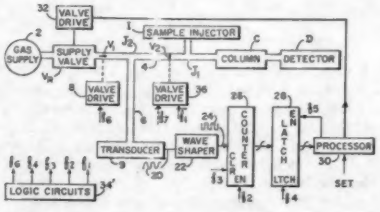
an operating handle operatively connected to said cylinder member from above.

4,373,549

MASS FLOW/PRESSURE CONTROL SYSTEM

Roger A. Nalepa, Landenberg, Pa., and Michael A. Casale, Newark, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 12, 1979, Ser. No. 11,333
Int. Cl.³ F16K *31/02*
U.S. Cl. 137—487.5 **17 Claims**



11. Apparatus for controlling the flow of a gas from a pressurized source so as to maintain a constant pressure on a load, comprising

a valve having an input to which gas under pressure may be coupled and an output,

means defining a volume V having an inlet port coupled to the output of said valve and an outlet port to which a load may be coupled,

pressure signal producing means including a transducer for producing, when activated, an electrical signal representing the pressure in said volume V,

means for placing said valve in an open position during a first portion of each of a plurality of successive cycles and for placing it in a closed position during the remainder of each cycle,

means for activating said pressure signal producing means during the end of said first portion of each cycle so as to produce a signal representing the pressure P_A of the gas in the volume V,

means for activating said pressure signal producing means during the end portion of each cycle so as to produce a

signal representing the pressure P_B of the gas in the volume V, and

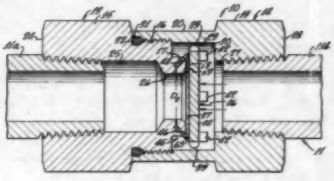
means responsive to one of the signals representing the pressures P_A or P_B for controlling the amount of gas that flows through said valve in each cycle so as to maintain said one pressure at a predetermined set value.

4,373,550

VALVE HAVING A BIAS-MOUNTED ELASTOMERIC SEALING ELEMENT, AND METHOD OF CONSTRUCTING THE SAME

William Yelich, Costa Mesa, Calif., assignor to Cla-Val Co., Newport Beach, Calif.

Filed Jul. 28, 1980, Ser. No. 172,563
Int. Cl.³ F16K *15/00*
U.S. Cl. 137—516.29 **12 Claims**



1. A valve comprising:

(a) a body having a forwardly facing seating surface and a frustoconical annular groove formed in said body;

(b) an elastomeric annular sealing washer, said washer having a radially inner portion retained in said groove, and having an outer circumferential edge disposed forwardly of said seating surface;

(c) a valve closure having a surface extending across said seat and radially outwardly thereof, said valve closure being mounted for movement between an open position displaced from said washer and a closed position in which the closure has a line contact with said washer edge and extends radially outwardly of said edge;

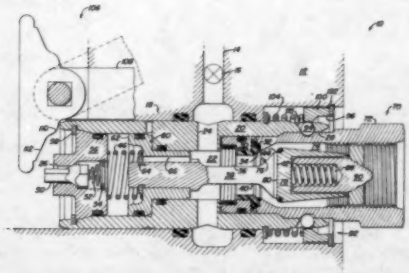
(d) said washer being flat in unstressed condition and the radially inner portion of said washer being held in a stretched frustoconical configuration by said groove.

4,373,551

DRIPLESS COUPLER

Aloysius C. Shindelar, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 12, 1981, Ser. No. 224,598
Int. Cl.³ F16L *37/28*
U.S. Cl. 137—614.06 **19 Claims**



1. A dripless coupler comprising:

(a) a housing having a fluid passage formed therein;

(b) a female coupler movably retained in said housing, said female coupler including a receptacle enclosing a cavity having an inlet port communicating with said fluid passage formed in said housing, an open bore located at one end of said cavity and an outlet port axially aligned with said open bore, a movable seat positioned in said open bore portion of said receptacle, main valve means mateable with said movable seat for blocking fluid flow through said open bore, said main valve means having a flat end surface, and secondary valve means for controlling fluid flow through said outlet port;

(c) a male coupler insertable into said open bore portion of said female coupler, said male coupler including a receptacle enclosing a cavity having an inlet opening in which a movable check valve is positioned, said check valve having a flat end surface mateable with said flat end surface of said main valve means located in said male coupler;

(d) movable piston means for assisting in moving said main valve means against fluid pressure contained in said male coupler; and

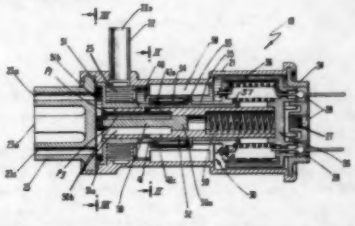
(e) lever-actuatable cam means for moving both said receptacle of said female coupler and said secondary valve means, said lever-actuatable cam means being pivotally attached to said housing.

4,373,552

ELECTROMAGNETIC FLOW CONTROL VALVE ASSEMBLY

Shoji Ito, Nagoya, and Motonobu Akagi, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 3, 1980, Ser. No. 203,517
Claims priority, application Japan, Nov. 8, 1979, 54-145673
Int. Cl.³ F16K *11/04, 31/08*
U.S. Cl. 137—625.48 **5 Claims**



1. An electromagnetic flow control valve assembly comprising:

a valve body including an inlet port and a plurality of outlet ports; and

valve means in said body for controlling fluid communication between said inlet port and said outlet ports;

said valve means including a hollow iron core having a peripheral wall, a plurality of individual passages, each of said passages being in fluid communication with a corresponding one of said outlet ports;

a plurality of individual apertures in said peripheral wall, one of said apertures corresponding to each of said passages for forming a fluid path between each of said outlet ports and said inlet port; and

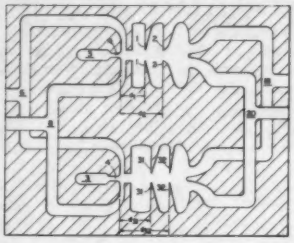
bobbin means including a bobbin slidably mounted on the core for simultaneously and linearly controlling fluid flow between said inlet port and all of said plurality of outlet ports through said plurality of apertures in response to electric current applied to said bobbin means, said bobbin for moving axially between one position wherein said fluid paths are all closed by said bobbin, and a second position wherein said apertures are uncovered for opening all of said fluid paths.

4,373,553

BROAD BAND FLUERIC AMPLIFIER

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 14, 1980, Ser. No. 111,738
Int. Cl.³ F15C 1/08
U.S. Cl. 137—840 13 Claims



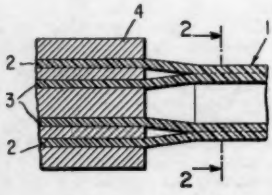
1. A broad band proportional flueric amplifier comprising:
input means for directing a jet of fluid outwardly from a nozzle;
output means comprising two output channels;
control means for deflecting the jet toward an output channel and for causing the jet to oscillate between the output channels; and
at least one set of protrusions situated on opposite sides of the jet path, each protrusion being positioned at a distance from the edge of the undeflected jet which does not exceed one half the width of said jet such that the deflected jet will just touch the protrusion when the output of the amplifier is fully saturated.

4,373,554

SELF-SEALING ARTICLE AND PROCESS

Paul M. Cook, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 228,300, Oct. 4, 1962, abandoned, and a continuation-in-part of Ser. No. 58,401, Jul. 27, 1970, abandoned. This application Apr. 18, 1974, Ser. No. 462,120
Int. Cl.³ F16L 11/12
U.S. Cl. 138—137 13 Claims



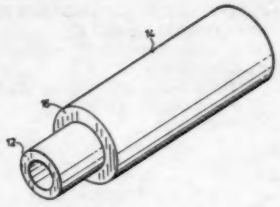
1. A monolithic tubular article comprising an outer and an inner concentric tubular wall portion, said concentric wall portions being intimately bonded with each other, said intimate bond having been formed by fusing said wall portions together or by forming a chemical bond between said wall portions, one of said tubular portions comprising a heat-recoverable polymeric material being infusible at the temperature of heat-recoverability, the other said portion comprising a polymeric material fusible at the temperature of heat-recoverability.

4,373,555

CUT-OUT FUSE TUBE

Morris Mattuck, La Chute, and Rheal Comte, Ste. Marthe-sur-le-Lac, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 2, 1981, Ser. No. 326,548
Int. Cl.³ D03D 35/00; H01H 85/02
U.S. Cl. 138—140 20 Claims



1. An arc-quenching composition comprising heat-treated polyester fibre material supported in a cycloaliphatic epoxy resin matrix.

6. A multiple layered laminate having an arc-quenching surface layer comprising a heat-treated polyester fibre material supported in a cycloaliphatic epoxy resin matrix.

9. A fuse tube comprising the composition of claim 1.

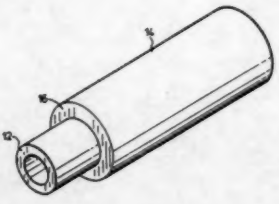
13. A fuse tube having a multiple layered laminate construction including:
an inner arc-quenching surface layer comprised of a wound filamentous heat-treated fibre material supported in a cycloaliphatic epoxy resin matrix; and, also including at least one other outer layer of filament wound glass fibre reinforced epoxy resin, said other layer being bonded to said surface layer.

4,373,556

CUT-OUT FUSE TUBE

Daniel D. Bergh, Lenox, Mass., assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 2, 1981, Ser. No. 326,549
Int. Cl.³ D03D 35/00; H01H 85/02
U.S. Cl. 138—140 13 Claims



1. An arc-quenching composition comprising polyester fibre material supported in a cycloaliphatic epoxy resin matrix.

6. A multiple layered laminate having an arc-quenching surface layer comprising a polyester fibre material supported in a cycloaliphatic epoxy resin matrix.

8. A fuse tube comprising the composition of claim 1.

4,373,557
APPARATUS FOR PICKING THE SHUTTLES OF A LOOM

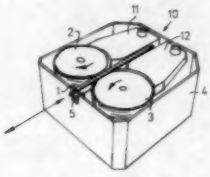
Robert Gründler, Arbon; Josef Fuchs, Steinach, both of Switzerland, and Herbert Jenni, Götzis, Austria, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Apr. 6, 1981, Ser. No. 250,941

Claims priority, application Switzerland, Apr. 24, 1980, 3176/80

Int. Cl.³ D03D *42/24*

U.S. Cl. 139—142 **6 Claims**



1. An apparatus for picking shuttles, especially projectile-like shuttles of a loom, comprising:

at least one pair of driven rolls which can be placed into contact with opposite sides of a shuttle to be inserted into a shed along a predetermined trajectory;

a respective spring-loaded pivotal lever at which there is rotatably mounted a related one of the rolls;

said pivotal levers extending essentially parallel to the shuttle trajectory;

each of said pivotal levers being pivotable about a stationary axis and having a free end;

means for simultaneously placing both of the rolls into contact with the shuttle;

said placing means including an adjustment element;

pressure springs acting at said free ends of said pivotal levers for placing the free ends of both pivotal levers into operative association with said adjustment element; and

said rolls possessing a radial resilient-yielding action which increases at least approximately lineraly as a function of the increasing radial contact pressure upon placement of the rolls into contact with the shuttle.

4,373,558
BOOKBINDING WIRE STOCK PRODUCTION METHOD AND APPARATUS

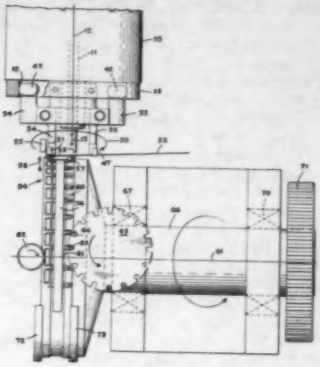
Kenneth H. Dawson, Newark, Calif., assignor to Spiral Binding Company, Inc., Clifton, N.J.

Filed Sep. 24, 1980, Ser. No. 190,447

Int. Cl.³ B21F *1/04*

U.S. Cl. 140—71 R **5 Claims**

1. Apparatus for producing wire bookbinding stock comprising a pusher shaft for rotation in incremental steps and for reciprocating motion relative to the axis of rotation, a hub for supporting said shaft, a pair of forming arm members secured to said hub for pivotal movement relative to said hub and for drawing wire from a supply, cam followers connected to said members for controlling the pivotal motion of said forming arm members, a ring spaced slightly from and in alignment with one of said forming arm members, a set of pins protruding radially from the rim of said ring for sequential alignment with one of said forming arm members, and another ring axially aligned in a plane parallel with and spaced axially from said ring, said another ring also having a set of pins protruding radially from the rim thereof for sequential alignment with said pusher shaft, whereby said forming arm members lace the wire around said sequentially aligned pins in order to keep uniform



tension on the wire throughout winding to avoid creating stresses in the wire and thus produce wire bookbinding stock.

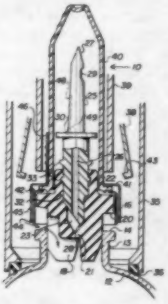
4,373,559
APPARATUS FOR PRESSURIZING AN ADDITIVE TRANSFER DEVICE

Donald L. Mowles, Libertyville; James F. Middaugh, Gurnee; Sangvorn Rutnarak, Vernon Hills, and Joseph N. Genese, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 4, 1980, Ser. No. 213,132

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—18 **14 Claims**



9. An apparatus for pressurizing an additive transfer unit for storing and transferring a fluid material to a solution container having an exposed closure, said transfer unit including:

a self-pressurized additive container for storing the fluid material to be transferred, said additive container having a rigid neck portion defining a finish, the opening in said container being sealed by a closure affixed thereto;

said closure having a shoulder for resting against said finish of the rigid container neck, said closure including a puncturable stopper positioned in sealing engagement with the opening in the additive container and in a substantially stationary manner, said stopper including channel portion to permit the introduction of a pressurizing media when said closure partially engages said container neck;

means for affixing the stopper to the additive container;

said stopper including a central opening extending along the longitudinal axis thereof with an end of the stopper pro-

jecting into the container being sealed by said puncturable diaphragm;

a piercing member having a passageway therethrough for the flow of said medicament and a point on both ends thereof and slidably disposed within the central opening in said stopper, one end of the piercing member extending from said opening;

said piercing member having a stop and being movable from a first position for entry through the closure of the solution container to a second position for puncturing of the diaphragm of the stopper in the additive container and permit the said fluid material within the additive container to transfer into the solution container;

said stop of the piercing member including an annular shoulder extending from the body thereof at a point in the portion of the piercing member which extends from the central opening in the stopper, said shoulder preventing excessive movement of the piercing member in the central opening in the stopper when the piercing member is inserted in the closure of said solution container;

said piercing member including an elongated body with said point on either end thereof and a projection extending from the body intermediate the ends thereof;

the central opening within the stopper including an undercut to receive the projection on the piercing member when the piercing member is moved from the first position to the second position within the central opening in the stopper for puncturing of the diaphragm of the stopper whereby the projection on the piercing member will engage the undercut in the opening in the stopper to thereby retain the piercing member within the opening in the stopper when the transfer unit is withdrawn from the solution container;

said apparatus comprising:

filling collar means engagable in a fluid tight manner on said additive container and surrounding said closure, said filling collar means being operatively connected to a source of pressurizing fluid media; and

crimping means concentrically and internally positioned with respect to said filling collar means to engage said closure affixing means to affix said closure to said additive container;

a pathway being formed by said closure channel portion in said diaphragm portion to permit the pressurizing fluid media to enter the additive container from the filling collar means.

4,373,560

APPARATUS FOR FILLING CAULKING TUBES

Robert M. Elsworth, c/o Sam Gray, Main Box 19, Georgetown, Exuma, The Bahamas, assignor to Robert M. Elsworth, Londonville, N.Y.

Filed Apr. 18, 1979, Ser. No. 31,115
Int. Cl.³ B65B *3/12*
U.S. Cl. 141—129 **26 Claims**

1. An improved apparatus for filling caulking cartridges with viscous liqid compositions comprising,

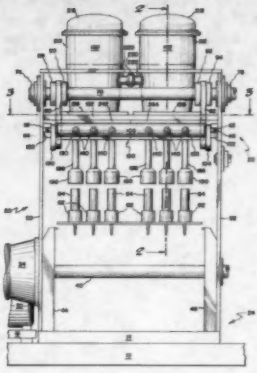
a frame;

a drive means at the lower portion of said frame having conveyor belt means which conveyor belt means passes through the lower portion of said frame said conveyor means carrying a plurality of caulking cartridges which are initially empty;

a reservoir means at the top portion of said frame having therein stored said viscous compositions;

linkage means driven by said drive means and extending from lower portion of said frame to the upper portion of said frame;

block means located beneath said reservoir means on said frame and containing therein core means with cavities for receiving said compositions and piston means located adjacent to said block and core means wherein said linkage means drives said core means and said piston means to receive measured quantities of said viscous compositions from said reservoir means and deposit said compositions in empty caulking cartridges passing on said conveyor



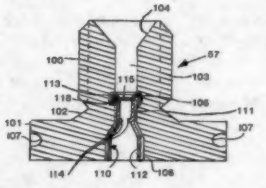
means under said valve core means and piston means wherein said core means rotates in said block means by the use of roller bearing means.

4,373,561

SUMP OIL DRAINING AND COLLECTING DEVICE

Jürgen Berger, Rheingaustr. 115, D-6200 Wiesbaden, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 174,007
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—330 **7 Claims**



1. A device for draining and collecting oil from motor vehicle oil sumps comprising:

an oil collecting vessel;

a drain hose;

a drain spigot having a first and a second end, the first end comprising an edge and the second end being attached to the drain hose;

a drain plug having a body provided with oil outlet passage, which is closed by a membrane;

wherein the spigot is formed for engagement into the oil outlet passage, the first end of the spigot being capable of rupturing the membrane thus providing an oil outlet flow from the oil sump through the oil outlet passage, the spigot, the drain hose into the oil collecting vessel;

wherein the membrane is formed by a plastic cup and further comprising means for locking said cup in said oil outlet passage; and

wherein said plastic cup has a ring collar surrounding said membrane, and wherein said oil outlet passage has a ring groove, said ring groove and said ring collar being formed as to engage in a snapping action.

4,373,562

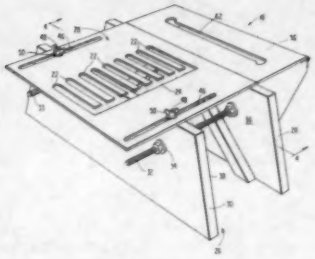
SPLINE JOINTS AND METHOD AND APPARATUS FOR MAKING SAME

Joseph O. Vernon, 209 Lyons Ave., Tazewell, Va. 26451

Continuation-in-part of Ser. No. 198,072, Oct. 17, 1980, abandoned. This application Dec. 11, 1980, Ser. No. 215,315

Int. Cl.³ B27C 5/10

U.S. Cl. 144—144.5 R 10 Claims



1. An apparatus for forming a joint between two flat members having bevelled ends in abutting relationship comprising:

(a) a groove forming template having slot means for guiding a router through a path;

(b) a stationary member and adjustable member moveable relative to said stationary member, said groove forming template being fixed to said stationary member;

(c) said stationary member and said adjustable member having opposed inner faces with guide means for locating flat members at an angle to the underside of said template, with an end of a flat member sufficiently adajcent said template to permit a router to cut a groove through the ends when said router is moved through said slot means; and

(d) securing means for securing a flat member between said moveable member and said stationary member and positioned against said guide means and in a plate substantially perpendicular to said inner faces.

4,373,563

SAWING OF LUMBER FROM LOGS

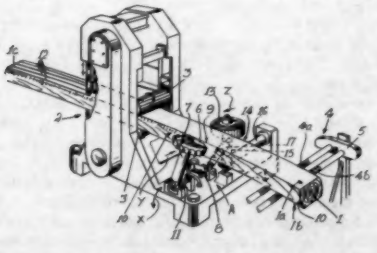
Alan Kenyon, House No. 3, Acme Township, Sabie, Transvaal, South Africa

Continuation of Ser. No. 950,313, Oct. 10, 1978, abandoned, which is a division of Ser. No. 599,950, Jul. 28, 1975, Pat. No. 4,127,044. This application Jan. 29, 1981, Ser. No. 230,041

Claims priority, application South Africa, Jul. 30, 1974, 74/4840

Int. Cl.³ B27B 1/00

U.S. Cl. 144—357 8 Claims



1. A method of sawing boards, planks or other sawn lumber from an elongated timber log or cant, comprising the steps of feeding the log or cant, longitudinally through a saw; sensing the longitudinal configuration of an unsawn longitudinally extending side surface of the log or cant on one side only of the log or cant as the latter passes through the saw; orientating the log or cant relative to the saw in accordance with the sensed configuration by exerting only resilient lateral orientating pressure on the log or cant, only on the unsawn side thereof on which the longitudinal configuration is sensed to saw the log or cant longitudinally along at least one saw line substantially parallel to the sensed configuration and restricting the laterally inward extent of the action of the resilient orientating pressure on the log or cant according to the required spacing of the saw line from the sensed configuration.

4,373,564

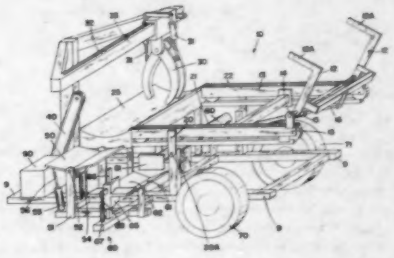
SELF-PROPELLED WOOD PROCESSING APPARATUS

Leo L. Heikkinen, Prentice, Wis. 54556

Filed Nov. 13, 1980, Ser. No. 206,522

Int. Cl.³ B27L 7/00

U.S. Cl. 144—366 10 Claims



1. A self-propelled apparatus for converting a log into firewood comprising:

a pick-up member for lifting a plurality of logs onto a log deck;

a tiltable log deck for receiving a plurality of logs and for coacting with said pick-up member;

means for delivering a log from said log deck to a log feeder;

a log feeder having means for grasping and securely holding a log;

means for cutting the log into fireplace wood when said log is held by said log feeder;

means for diverting the cut logs to a splitting mechanism;

a splitting mechanism for splitting the cut logs into fireplace wood; and

means for propelling the apparatus to permit an operator to pick logs from a pile with said pick-up member and then transfer the logs to said log deck.

4,373,565

MALLET

Eduardo R. R. Soto, Rosario, Argentina, assignor to Tecnologia Argentina S.A., Rosario, Argentina

Filed Mar. 17, 1981, Ser. No. 244,782

Claims priority, application Argentina, Apr. 16, 1980, 280707

Int. Cl.³ B25D 1/00

U.S. Cl. 145—36 10 Claims

1. Malet or hammer having

a metal core (**100**) having two end surfaces (**102, 103**), and a bottom surface (**109**);

an opening (M, M') formed in the core and extending through the bottom surface to receive a handle (L);

and striking portions (**201, 202**) of elastomer material secured to the metal core,

wherein, in accordance with the invention,

the metal core (**100**) has generally ellipsoid shape;

the end surfaces (**102, 103**) are parallel planes having a sur-

face area which is between 50% to 70% of the area of the core at a central section thereof;

an essentially plane top surface (**106**) extending transversely to the end surfaces;

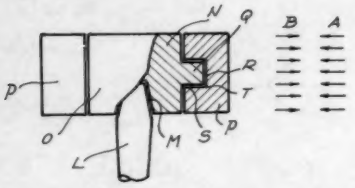
essentially plane side surfaces (**107**, **108**) extending laterally of a plane of symmetry through the handle opening (M, M');

a first inclined surfaces (**110**) connecting said end surfaces (**102**, **103**) with said plane top surface (**106**);

second inclined surfaces (**112**) connecting the end surfaces (**102**, **103**) and the bottom surface (**109**);

third inclined surfaces (**111**) connecting said end surfaces (**102**, **103**) and said side surfaces (**107**, **108**);

a projection (**104**, **105**) extending at right angles from each of the plane end surfaces (**102**, **103**), said projections having rounded end portions;



and wherein a unitary plastic cover element (**200**) is provided having said striking portions (**201**, **202**) formed thereon at terminal ends of said element,

said plastic cover element being formed with internal surfaces which match and fit said end surfaces (**102**, **103**), said top surface (**106**), said side surfaces (**107**, **108**) and said first, second and third inclined surfaces (**110**, **111**, **112**),

the striking portions (**201**, **203**) being formed with recesses to accept said projections (**104**, **105**); and

wherein the area of the cover element, in transverse section, increases by at least 30% from the end surfaces of the striking portions to the central section, and the wall portions of the cover element adjacent said top surface and said side surfaces are of essentially uniform thickness.

4,373,566

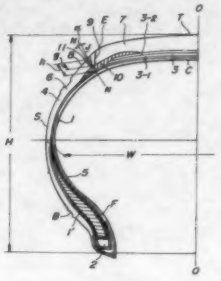
PNEUMATIC RADIAL TIRE HAVING A REDUCED ROLLING RESISTANCE

Hiroshi Hirakawa, Musashino; Akio Sato, Higashimurayama; Takashi Takusagawa, Ohme, and Nobumasa Ikeda, Kodaira, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 270,206
Claims priority, application Japan, Jun. 17, 1980, 55-80892
Int. Cl.[3] **B60C** *9/18, 13/00*
U.S. Cl. 152—353 G **8 Claims**

1. A pneumatic radial tire comprising;

a toroidal carcass including radially arranged cords, a belt layer superimposed about the crown portion of the carcass and including a plurality of cord layers, each cord being inclined at an angle within a range between 60° and 80° with respect to the radial plane of the tire and each cord of adjacent cord layers being crossed with each other, a bead core around which the lower end of the toroidal carcass is wound to form a turn-up portion, a rubber filler disposed on said bead core and sandwiched between the carcass and its turn-up portion; a side rubber outwardly covering a side portion and bead portion of the toroidal carcass, a tread rubber for outwardly covering the crown portion of the carcass inclusive of the belt layer and forming a joint portion with the side rubber, a relatively thin base rubber disposed directly below the joint portion between the side rubber and the tread rubber and superimposed about the outer surface of the carcass and belt layer and made integral therewith, said base rubber having a loss modulus of elasticity of 2.0 to 12 kg/cm^2 and its side edge portion extending to below the side rubber, and a stress relieving groove composed of a depression of



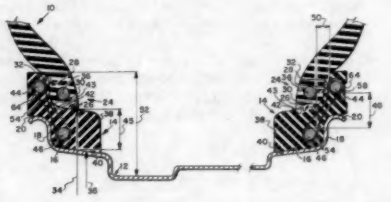
the side rubber facing toward the base rubber at a position near the joint portion between the side rubber and the tread rubber and extending along the circumference of the tire.

4,373,567

TIRE RIM AND ADAPTER

Pierre J. R. Declercq, Gilsdorf, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 10, 1980, Ser. No. 196,727
Int. Cl.[3] **B60B** *21/10, 25/08*
U.S. Cl. 152—405 **13 Claims**



1. An adapter for adapting a rim to a tire having a bead diameter larger than the diameter of the rim bead seats, said rim having a bead seat extending generally parallel to the rotational axis of the rim and a flange which extends generally radially outwardly therefrom to normally engage the bead portions of a tire for mounting of a tire on the rim, and a tire having a bead core in a bead portion which has a radially inner seating surface and a surface which extends generally radially outwardly therefrom, the diameter of the radially inner seating surface of the bead portion of the tire being greater than that of the rim bead seat, said adapter comprising an annular body having a first surface which is contoured to conform to and engage the respective flange and bead seat of the rim, and a second surface having a bead seat which is contoured to conform to and engage the seating surface of the respective bead of the tire, and thereby provides a bead seat on the adapter located radially outwardly from the rim bead seat, when the adapter is mounted on the rim, a distance which is sufficient to locate the adapter bead seat at least partly radially outwardly of said rim flange, a pair of annular cores disposed within said annular body, and at least one reinforcing ply enveloping said pair of cores in said annular body, said cores in said annular body being spaced apart in a direction perpendicular to said axis a distance which is greater than the distance which they are spaced apart in a direction parallel to said axis, the radially outer core of said cores in said annular body being disposed at

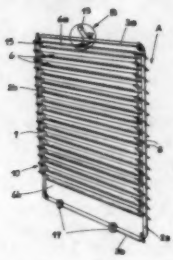
least in part radially outwardly of the respectively associated bead core in the tire, the radially inner core of said cores in said annular body being disposed at least in part in overlapping relationship to the respectively associated bead core in the tire in a direction parallel to said axis.

4,373,568

REDUCIBLE VOLUME SUN-BLIND

Enrico Lancellotti, Casalecchio di Reno, Italy, assignor to Sunfilter S.r.l., Bologna, Italy

Filed May 23, 1980, Ser. No. 152,842
Claims priority, application Italy, Jun. 7, 1979, 48563/79[U]
Int. Cl.³ E05D *15/00*; E06B *7/086*
U.S. Cl. 160—184 **9 Claims**



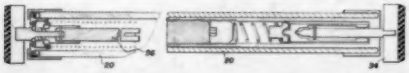
1. Reducible volume sun-blind comprising: an articulated parallelogram that defines a support frame for the blind; means for stabilizing the said parallelogram in any one of a plurality of configurations; a plurality of parallel strips having extremities rotatably connected, with respect to longitudinal axes of the individual strips, to two parallel sides of the parallelogram; elastic means for tensioning the said strips interposed between at least one extremity of said strips and the relevant side of the parallelogram; means responsive to a manual force on one of said blinds and positioned within the outer extremities of said parallelogram for synchronously rotating the said strips, with respect to their longitudinal axes, from a position in which surfaces of said strips are practically coplanar with the surface defined by the said parallelogram to a position in which the surfaces of the strips are approximately perpendicular thereto; and means for stabilizing the said strips in a desired one of a plurality of positions, said means for stabilizing extending between one of said strips and one of the sides of the parallelogram to thereby fix the orientation of the strips with respect to the parallelogram.

4,373,569

WINDOW SHADE ROLLER ASSEMBLY

Bernard Barettella, 688 Maple Ave., Ridgefield, N.J. 07657

Filed Oct. 6, 1980, Ser. No. 194,231
Int. Cl.³ A47G *5/02*
U.S. Cl. 160—263 **10 Claims**



1. A cylindrical window shade roller assembly adapted for mounting either by frictional engagement within the periphery of a window frame; or alternatively by being hang-mounted at receiving brackets on the window frame; said assembly comprising in combination:

a cylindrical window shade roller having a first and second axial recesses, respectively at the first and second ends thereof;

a projecting first shaft being mounted in said first recess to enable rotation of said shade roller thereabout during raising and lowering of the associated shade when said assembly is mounted at said window frame, and spring means wound during said rotation for biasing said roller to enable return thereof to its initial position;

a two-way mounting assembly being received at said second axial recess, said mounting assembly comprising:

(1) a hollow cylindrical housing adapted for being received in said second axial recess and terminating in a cap portion having a diameter larger than that of said housing, whereby said cap may close said second end of said shade roller;

(2) a second shaft extending centrally through said cap and into said housing, the externally facing distal end of said shaft terminating in a mounting pintle;

(3) spring means extending within said housing and bearing against a rearward closing thereof;

(4) a hollow cylindrical link within said housing between said shaft and spring means, said link being closed at the end thereof toward said spring and open at the other end thereof, said link receiving at its open end the rearward portion of said second shaft; said shaft being selectively moveable between a first longitudinal position where it is retracted within said link, and a second longitudinal position whereat said shaft is telescoped with respect to and detented at said link; said shaft being rotatable with respect to said housing at each of said first and second positions;

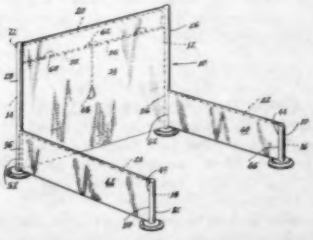
whereby when said second shaft is in said first, withdrawn position, substantially only said pintle projects through said cap to enable said hang-mounting of said window shade assembly; and whereby when said shaft is in said second, extended position, said window shade assembly may be frictionally secured within said window frame border by positioning the end of said first shaft in mechanical engagement with one side of said window frame periphery, moving said second shaft inwardly to compress said spring, emplacing said shade roller assembly within said frame, and permitting the restorative force of said spring to expand said second shaft against said window frame to effect frictional engagement therewith.

4,373,570

PORTABLE FABRIC DISPLAY BOOTH ASSEMBLY

Jeffrey M. Nussdorf, 1612 Worcester Rd., Framingham, Mass. 01701, and John C. McMillan, 24 St. John Pl., Westport, Conn. 06880

Filed Jul. 31, 1980, Ser. No. 173,954
Int. Cl.³ A47G *5/00*
U.S. Cl. 160—352 **5 Claims**



1. A portable fabric display booth assembly for at least partially enclosing an area defined by a pair of spaced posts and a pair of spaced standards having side and back railings respectively comprising: each of said posts and standards being provided with a sleeve having a first closure member for closing and opening said sleeve and a second closure member, a pair of flat fabric pieces each having closure members on opposite

ends thereof which are adapted to be supported by respective side railings and to be interconnected with respective closure members on said respective post and standard to form side fabric panels, a main flat rear fabric piece supported by the back railing and having closure members at opposite ends thereof for interconnecting with the closure members on the sleeves on said spaced standards to form the back fabric panel of said display booth, a marginal top edge of said main flat rear fabric piece having an elongated sleeve coextensive therewith, an expandable pole in said elongated sleeve, and pockets located on the rear of each sleeve on said standards to hold the ends of said pole when said top of said flat fabric piece is drawn over the back railing to thereby hold said main piece in a taut condition.

4,373,571

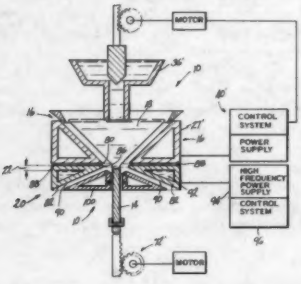
APPARATUS AND PROCESS FOR ELECTROMAGNETICALLY SHAPING A MOLTEN MATERIAL WITHIN A NARROW CONTAINMENT ZONE

John C. Yarwood, Madison, Conn.; Gerhart K. Gaule, Elberon, N.J., and Gary L. Ungarean, Woodbridge, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 213,127, Dec. 4, 1980. This application Apr. 24, 1981, Ser. No. 257,442

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—467 **42 Claims**



1. In an apparatus for electromagnetically forming a material into a desired thin strip shape, said apparatus comprising:

first portion means for containing a sump of said material in molten form,

second portion means downstream of and communicating with said first portion means, said second portion means defining a containment zone of 5 mm or less for electromagnetically shaping said molten material into said thin strip shape whereby efficiency is improved by reducing power consumption.

4,373,572

COMMERCIAL LAUNDRY HEAT RECOVERY SYSTEM

Richard O. Kaufmann, Tucson, Ariz., assignor to Thermal Engineering of Arizona, Inc., Tucson, Ariz.

Filed Mar. 5, 1981, Ser. No. 240,844

Int. Cl.³ F24H *1/00*

U.S. Cl. 165—1 **8 Claims**

6. A method for recovering heat from heated waste water in a commercial laundry, said method comprising the steps of:

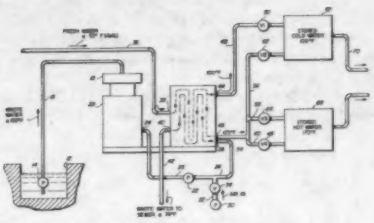
(a) pumping the heated waste water through a plate and frame heat exchanger;

(b) entraining air bubbles in the pumped waste water to scour the surfaces of the plate and frame heat exchanger coming in contact therewith;

(c) introducing fresh water into the plate and frame heat exchanger to receive heat from the waste water through a heat transfer effected by the plate and frame heat exchanger;

(d) withdrawing a first proportion of the heated fresh water;

(e) conveying the first proportion of the heated fresh water to a cold water storage tank;



(f) withdrawing a second proportion of the heated fresh water; and

(g) conveying the second proportion of the heated fresh water to a hot water storage tank.

4,373,573

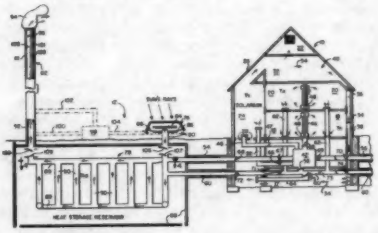
LONG TERM STORAGE AND USE OF SOLAR ENERGY

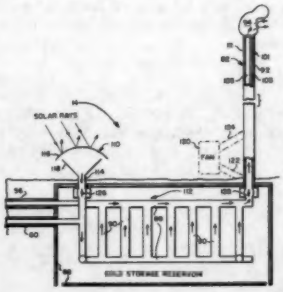
Albert Madwed, 25 Saxton Dr., Bridgeport, Conn. 06604

Filed May 2, 1980, Ser. No. 146,125

Int. Cl.³ F25B *13/00*; F24J *3/02*

U.S. Cl. 165—2 **16 Claims**





16. A method for the storage and use of solar energy by a thermal load over long term periods which comprises:

(a) introducing air from the atmosphere into a collection zone;

(b) passing the air from said collection zone into and through an underground storage zone having a heat capacity sufficient to store thermal energy for the major part at least of an entire heating or cooling period;

(c) during a first heating or cooling period, at times at least circulating an air stream into said collection zone, into and through said thermal storage zone at least in part by exposing an elongated column of air connecting the thermal storage zone with the atmosphere to solar heating, and outwardly from said thermal storage zone without passing through said thermal load, said stream affecting substantial heat exchange with the earth in said thermal storage zone during said first heating or cooling period; and

(d) during the succeeding heating or cooling season, respectively, isolating said underground thermal storage zone from the ambient atmosphere and flowing an air stream through said zone and through said thermal load to affect heating or cooling of said heat load.

4,373,574

METHOD AND APPARATUS FOR ALTERNATELY HEATING AND COOLING A HEAT EXCHANGER

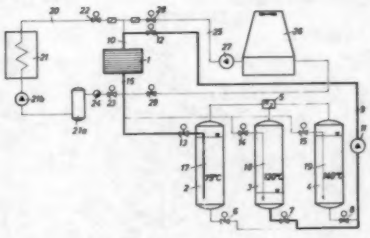
Otmar U. Schäfer, Pienzenauerstrasse 9, 8000 München 80, Fed. Rep. of Germany

Filed Jun. 18, 1980, Ser. No. 160,477

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943797

Int. Cl.³ F24D *11/00*

U.S. Cl. 165—2 **5 Claims**



1. A method of alternately heating and cooling a heat exchanger, such as a press or a reaction vessel, of a heating and cooling installation with heat recovery, and having at least two storage vessels respectively of higher and lower average temperature and a conduit system and a boiler, comprising the steps of:

feeding liquid of the storage vessel of higher temperature into said heat exchanger for heating-up of said heat exchanger, and for cooling-off of the heat exchanger, feeding into the heat exchanger liquid of said storage vessel of lower temperature,

feeding steam of a generator directly into the heat exchanger, in the last heating-up stage of the heat exchanger as well as during the heating stage, in which the heat exchanger is held at high temperature,

prior to said last heating-up stage, displacing the liquid heat carrier present in the heat exchanger and in a portion of said conduit system, into a liquid storage vessel with variable liquid level, and for the further heating-up and heating of the heat exchanger, steam from the steam generator is fed to the heat exchanger, and wherein during cooling-off the heat exchanger and said portion of the conduit system are first filled with liquid from said liquid storage vessel of variable liquid level.

4,373,575

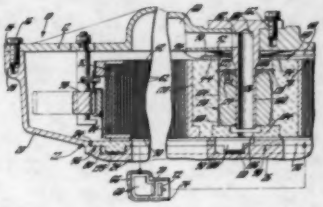
INBOARD SEAL MOUNTING

John R. Hayes, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 23, 1981, Ser. No. 246,430

Int. Cl.³ F28D *19/00*

U.S. Cl. 165—7 **3 Claims**



1. In a gas turbine engine regenerator system of the type including a regenerator disc disposed on a block portion of said engine for rotation about a spindle means and intercepting a pressurized compressor discharge passage and a power turbine exhaust passage, said compressor discharge and turbine exhaust passages being separated by an engine block cross arm, and inboard and outboard rim seal means between said disc and said engine block, an improved cross arm seal arrangement comprising, means on said engine block cross arm defining a groove flanked on opposite sides by a pair of flat surfaces, a ceramic seal means having a pair of flanges engaging respective ones of said flat surfaces to support said seal means on said engine block and a base disposed in said groove, said seal means engaging said disc and defining thereat a cross arm seal, leaf spring seal means disposed in said groove between said block cross arm and said ceramic seal means for completing separation between said compressor discharge passage and said turbine exhaust passage at said cross arm, first auxiliary passage means for directing pressurized cold air from a high pressure zone on one side of said disc to said groove through said spindle means thereby to pressure bias said leaf spring seal means into engagement on one of said ceramic seal means and said block cross arm, and second auxiliary passage means for directing said pressurized cold air from said groove to a lower high pressure zone on the other side of said disc thereby to permit flow-through of high pressure cooling air for cooling said spindle means and said leaf spring seal means.

4,373,576

HEATING, VENTILATING AND AIR CONDITIONING SYSTEM WITH REVERSIBLE AIR FLOW

Kenneth Strupczewski, 5213 Windward La., Bensalem, Pa. 19020

Filed Jan. 8, 1981, Ser. No. 222,948

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—48 R **6 Claims**

6. A heating and cooling system for a room comprising

first vent means positioned high in the room for delivering cooled air to the room;

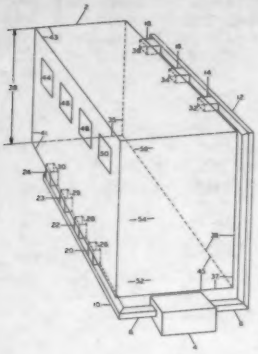
second vent means positioned low in the room for delivering heated air to the room;

duct means for conveying air connecting first and second vent means;

cooling means and heating means for alternately cooling and heating the room;

reversible rotation fan means for delivering more air when blowing in one direction than the other, said fan means

constituting means for causing the air to flow from the second vent to the first vent at higher velocity while



cooling, and for causing the air to flow from the first vent to the second vent at lesser velocity while heating.

4,373,577

HEAT EXCHANGER ASSEMBLY

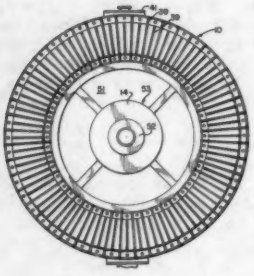
Russell G. McMillen, Fort Wayne, Ind., assignor to International Harvester Co., Chicago, Ill.

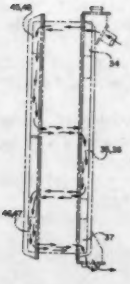
PCT No. PCT/US80/00935, § 371 Date Jul. 21, 1980, § 102(e) Date Jul. 21, 1980, PCT Pub. No. WO82/00343, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 21, 1980, Ser. No. 269,432

Int. Cl.³ F28F 9/26

U.S. Cl. 165—122 **21 Claims**





1. A heat exchanger assembly comprising:

a heat exchange means disposed about a central axis, said heat exchange means including:

fluid inlet means for introducing a fluid into the interior of said heat exchange means, fluid outlet means spaced from said fluid inlet means for discharging fluid from the interior of said heat exchange means, and fluid passageway means extending between and providing a fluid path between said fluid inlet means and said fluid outlet means, said fluid passageway means including a plurality of first elongatetd segment means lying generally in a first plane perpendicular to said central axis, a plurality of spaced segment means extending substantially parallel with respect to said central axis, one end of each of said spaced segment means being in fluid communication with a respective portion of a respective one of said elongated segment means, said fluid inlet means being in fluid communication with a portion of a respective first one of said first elongated segment means, said segment portion of said respective first one of said first elongated segment means being spaced intermediate the ends thereof, and said fluid passageway means further including a plurality of second elongated segment means lying generally in a second plane perpendicular to said central axis and axially spaced and parallel with respect to said first plane, and one end of each of said spaced segment means being in fluid communication with a respective portion of a respective one of said second elongated segment means.

4,373,578

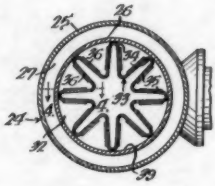
RADIATOR WITH HEAT EXCHANGER

Zalman P. Saperstein, Gurnee, Ill.; Refki M. El-Bourini, West Allis, and John E. Munch, Jr., Racine, both of Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Apr. 23, 1981, Ser. No. 257,223

Int. Cl.³ F28D 7/10

U.S. Cl. 165—141 **2 Claims**



1. A cooling radiator having secondary cooling means comprising:

a pair of spaced liquid coolant tanks, one of which is an inlet tank having a liquid coolant inlet adjacent one end and the other of which is a liquid outlet tank having an outlet adjacent its corresponding opposite end;

interconnecting spaced coolant tubes between said tanks for flow of liquid coolant between the tanks by way of said tubes;

a heat exchanger for cooling a second liquid located in heat exchange relationship with said outlet tank, said heat exchanger having spaced inlet and outlet, a confined liquid space therebetween for flow of a liquid through the space in heat exchange relationship with the liquid coolant in said outlet tank, said heat exchanger comprising substantially concentric tubes spaced apart to provide a confined liquid space; and

an internal fin within said heat exchanger located within an inner tube in heat exchange relationship with the liquid in said outlet tank, said heat exchanger internal fin comprising a sheet metal heat conducting member having spaced sides arranged in a star shape with the star tips bearing against the inner surface of the inner tube and said tips comprising the outer extremities of spaced fingers com-

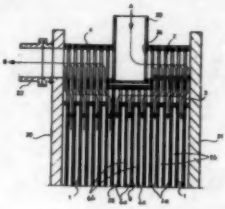
prising said star, the sides of said fingers having apertured flutes for creating turbulence in the liquid coolant flowing through said inner tube, over the inner and outer surfaces of said sheet metal and through said fluted apertures.

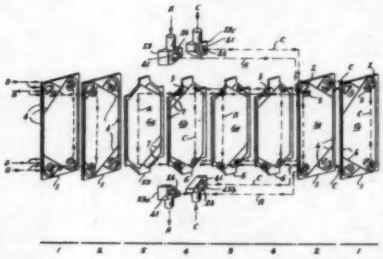
4,373,579

PLATE HEAT EXCHANGER

Ake Jernqvist, Lund, and Ulf Bolmstedt, Staffanstorp, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Jun. 30, 1980, Ser. No. 164,144
Claims priority, application Sweden, Jul. 6, 1979, 7905915
Int. Cl.³ F28F 3/08
U.S. Cl. 165—167 3 Claims





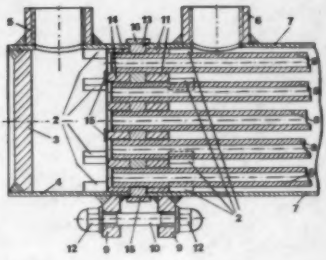
1. A heat exchanger comprising a first series of plates, a frame-work in which the plates are clamped adjacent to each other, peripheral gaskets located between adjacent plates and forming therewith a first series of heat exchanging passages for heat exchanging fluids, each plate being generally rectangular in shape and having at each of its corner portions an opening which forms with corresponding openings of adjacent plates a first manifold duct for one of said fluids, a second series of plates clamped adjacent to each other in said frame-work and each being generally rectangular in shape, peripheral gaskets located between adjacent plates of said second series and forming therewith a second series of heat exchanging passages for said fluids, each plate of said second series having one of its corners cut away to form a recess corresponding to a said opening in the plates of the first series, said recesses forming a space aligned with a said manifold duct, and a connection piece sealingly clamped in said space between said plates and communicating with said manifold duct, the plates of both said series each having a separate opening forming a second manifold duct, said first manifold duct being connected to heat exchanging passages of both series through said second manifold duct.

4,373,580

TUBE SEALING IN TUBE BUNDLE HEAT EXCHANGERS

Rene Gossalter, P.O. Box 715, St. Gallen, Switzerland

Continuation of Ser. No. 10,756, Feb. 9, 1979, abandoned. This application Mar. 12, 1981, Ser. No. 243,034
Claims priority, application Switzerland, Feb. 13, 1978, 1539/78
Int. Cl.³ F28F 9/04
U.S. Cl. 165—173 9 Claims



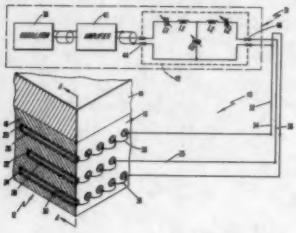
1. A tube bundle heat exchanger comprising a generally tubular housing including a jacket tube and an extension tube extending substantially coaxially with said jacket tube, said jacket and extension tubes having adjacent open ends relatively spaced apart, sealing means including an elastic sealing tube plate mounted in the space between said jacket and extension tubes and extending transversely thereof, a first rigid tube plate mounted within said extension tube in contact with said elastic tube plate and extending substantially parallel thereto, a second rigid tube plate mounted within said jacket tube in contact with said elastic tube plate and extending substantially parallel thereto, mounting means on at least one of said jacket and extension tubes for mounting at least one of said first and second rigid tube plates for movement axially of said jacket and extension tubes toward said elastic sealing tube plate, said mounting means including abutment means extending from the inner surfaces of at least one of said jacket and extension tubes for engaging the respective surface of the axially movable rigid tube plate which is opposite the surface thereof in contact with said elastic sealing tube plate, a plurality of heat exchanger tubes extending in spaced relationship axially of said jacket and extension tubes through aligned apertures formed in said first and second rigid tube plates and said elastic sealing tube plate, one end of each of said heat exchanger tubes opening into said extension tube, tube retaining means formed on said first rigid tube plate for retaining said heat exchanger tubes within said first rigid tube plate, circumferential sleeve means extending around the adjacent spaced ends of said extension and jacket tubes and over an annular gap therebetween to enclose said elastic tube plate, said sleeve means being formed to permit relative axial movement of said jacket and extension tubes, and a plurality of force applying means connected between said jacket and extension tubes and operative to move the spaced open ends thereof toward one another to cause axial movement of said first and second rigid tube plates against opposite sides of said elastic sealing tube plate and expansion of said elastic sealing tube plate against said heat exchanger tubes and the adjacent open ends of said extension and jacket tubes to enhance the sealing of said annular gap.

4,373,581

APPARATUS AND METHOD FOR RADIO FREQUENCY HEATING OF HYDROCARBONACEOUS EARTH FORMATIONS INCLUDING AN IMPEDANCE MATCHING TECHNIQUE

Robert L. Toellner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 19, 1981, Ser. No. 226,308
Int. Cl.³ E21B *43/24, 47/00, 43/12*
U.S. Cl. 166—53 **9 Claims**



1. An impedance matching network having a first port connected to a high power radio frequency transmitter and a second port connected to a transmission line including conductors at least partially embedded in a hydrocarbonaceous earth formation to be heated, comprising a first and a second variable reactance means, said first and second variable reactance means comprising respectively, first and second independently variable capacitors, connected in series to form an upper leg of a T network; and a third variable reactance means, said third variable reactance means comprising a third independently variable capacitor, in shunt between the first and second variable reactance means to form the central leg of a T network, wherein the impedance presented by said transmission line during the heating of the hydrocarbonaceous formation is matched by holding one of the variable reactances at its minimum or maximum and adjusting the other two variable reactance means.

4,373,582

ACOUSTICALLY CONTROLLED ELECTRO-MECHANICAL CIRCULATION SUB

John M. Bednar; Daniel P. Postler, and Terry V. Jones, all of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

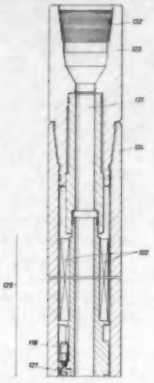
Filed Dec. 22, 1980, Ser. No. 218,602
Int. Cl.³ E21B *34/08, 34/16*
U.S. Cl. 166—65 R **53 Claims**

46. A device suitable for use in a wall as circulation sub comprising:

a housing having an inner bore, an exterior wall, at least one circulation port allowing fluid communication between the inner bore and the exterior wall and adapted at its upper and lower ends to connect to well drilling pipe or collars;

a piston sleeve slidably mounted within the inner bore of the housing, covering said at least one circulation port in one position, and having pressure responsive means adapted to move the piston sleeve to another position uncovering said at least one circulation port upon application of sufficient fluid pressure from the fluid communicating between the inner bore and exterior wall;

control valve means adapted to apply said sufficient fluid pressure to said piston sleeve pressure responsive means to move said piston sleeve to said another position; and



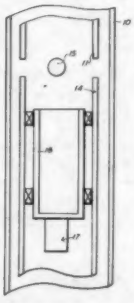
means for receiving an acoustic signal from an upper portion of the well and adapted to actuate said control valve means.

4,373,583

TEST-SYSTEM

Fleming A. Waters, Odessa, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 5, 1982, Ser. No. 337,098
Int. Cl.³ E21B *34/14*
U.S. Cl. 166—113 **3 Claims**



1. A test system for wells comprising,

a landing nipple having locking grooves therein,

a lock mandrel releasably locked in said landing nipple,

a pressure relief valve carried by the lock mandrel,

a valve suspended from the lock mandrel,

said valve including a valve body having lateral ports at its upper end and a valve member movable between open and closed positions,

a closing tool for engaging said valve member and moving it from open to closed position,

means for releasing said closing tool from said valve member with said valve member in closed position,

said closing tool having a small diameter extension at its upper end,

said closing tool and the valve member dimensioned such that said closing tool extension is opposite said ports when said tool and valve member are engaged and said valve member is in its open position, and

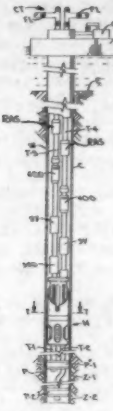
a pressure recording instrument suspended from the valve.

4,373,584

SINGLE TRIP TUBING HANGER ASSEMBLY

Raphael J. Silberman, Houston, Tex.; Frederick T. Tilton, La Habra, Calif.; Everett H. Smith, Houston, and Dennis A. Wichkoski, Pasadena, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed May 7, 1979, Ser. No. 36,964
Int. Cl.³ E21B *19/00*
U.S. Cl. 166—117.7 **65 Claims**



1. An apparatus for producing a well from plural productive zones penetrated by the well bore in which casing is set below the top of the well, said apparatus comprising: tubing hanger means supporting a plurality of lower production tubing string sections extending downwardly in the well bore and respectively communicating with one of said productive zones; anchor means on said tubing hanger means activatable into anchoring engagement with said casing; plural upper production tubing string sections received in said hanger means and extending to the top of the well and sealingly engaged within said tubing hanger means before, during, and after the anchoring engagement of said tubing hanger means with said casing; a latch apparatus carried on and extending between said upper production tubing string sections for initial securement of said tubing hanger means to each of said upper production tubing string sections and for unlatching of said upper production tubing sections from said hanger means, the sum of the weight of said tubing hanger means and each of said lower production tubing string sections, carriable by said latch apparatus prior to anchoring said tubing hanger means with said casing, whereby said upper production tubing string sections are respectively communicable with said downwardly extending production tubing string sections when the tubing hanger is set for production of the well.

4,373,585

METHOD OF SOLVENT FLOODING TO RECOVER VISCOUS OILS

John L. Fitch, Dallas, and Lynn D. Mullins, De Soto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 21, 1981, Ser. No. 285,696
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—263 **27 Claims**

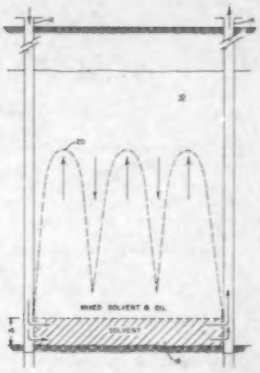
1. A method of recovering viscous oil from a viscous oil-containing subsurface formation penetrated by at least one injection well and one production well comprising:

(a) establishing a fluid communication path extending between the injection well and the production well near the lower portion of said oil-containing formation;

(b) injecting a hydrocarbon solvent via said injection well into said fluid communication path, said solvent having a specific gravity less than the specific gravity of the oil contained in the formation and a viscosity not greater than 1/100 the viscosity of the oil contained in the formation under formation conditions and recovering fluids including oil and solvent from the fluid communication path via the production well until the fluid comprises an unfavorable ratio of oil to solvent;

(c) thereafter shutting-in said production well;

(d) continuing to inject a quantity of said hydrocarbon solvent into the fluid communication path via said injection well;



(e) shutting in said injection well along with the shut-in production well to permit said formation to undergo a soak period for a time sufficient for gravity-driven convection to substantially mix the solvent with the oil in the formation and thereby reduce its viscosity; and

(f) thereafter injecting a driving fluid into the formation via said injection well and recovering fluids including oil from said formation via said production well until the fluid being recovered from the production well comprises an unfavorable ratio of produced oil to driving fluid.

4,373,586

METHOD OF SOLVENT FLOODING TO RECOVER VISCOUS OILS

William C. Hunt, III, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 7, 1981, Ser. No. 290,758
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—263 **38 Claims**

21. A method of recovering viscous oil from a viscous oil-containing subsurface formation, said formation having no significant permeability barrier therein, and penetrated by at least one injection well and one production well comprising:

(a) establishing a fluid communication path extending between the injection well and the production well near the lower portion of said oil-containing formation;

(b) providing an interior production well located between the injection well and production well in fluid communication with the upper portion of the oil-containing formation;

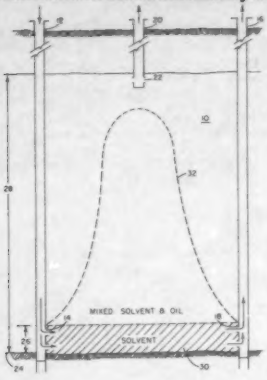
(c) injecting a hydrocarbon solvent via said injection well into said fluid communication path, said solvent having a specific gravity less than the specific gravity of the oil contained in the formation under formation conditions, and recovering fluids including oil from the fluid communication path via the production well until solvent is detected in the fluid recovered from the production well;

(d) thereafter shutting-in said production well;

(e) continuing to inject a quantity of said hydrocarbon sol-

vent into the fluid communication path via said injection well and recovering fluids including oil from the formation via said interior production well;

(f) shutting-in the injection well and the interior production well along with the production well to permit said formation to undergo a soak period for a time sufficient for gravity-driven convection to substantially mix the solvent



with the oil in the formation and thereby reduce its viscosity; and

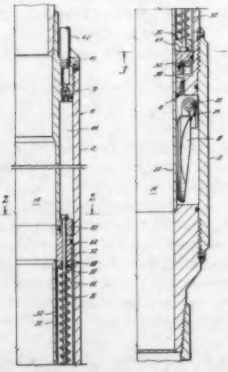
(g) thereafter injecting a driving fluid into the formation via said injection well and recovering fluid including oil from the formation via said production well until the fluid being recovered comprises an unfavorable ratio of produced oil to driving fluid.

4,373,587

FLUID DISPLACEMENT WELL SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Dec. 8, 1980, Ser. No. 214,069
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—324 **16 Claims**



1. A subsurface well safety valve for controlling the fluid flow through a well conduit comprising,

a housing having a bore therethrough,

a valve closure member positioned in the housing movable between open and closed positions in the bore,

a flow tube longitudinally movable in the housing for controlling the movement of the valve closure member,

means for biasing the flow tube in a first direction for causing the valve closure member to move to the open position,

a sealless gas chamber in said housing,

a fluid passageway positioned in the housing and adapted to receive fluid pressure from the well surface for increasing the pressure of the gas in the chamber, said passageway including a time delay restriction limiting fluid flow out of said housing for leaving a compressed gas in the gas chamber after the pressure from the surface is reduced,

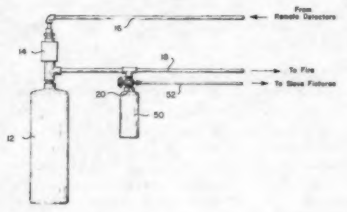
piston means in the housing connected to the flow tube, said piston means having a first end exposed to pressure in the passageway on a first side of the restriction, and having a second end exposed to pressure in the passageway on the second side of the restriction and subject to the pressure in the gas chamber whereby when pressure on the first side of the restriction is reduced the compressed gas will act on the fluid on the second side of the restriction to move the piston means in a direction to close the valve.

4,373,588

FIRE EXTINGUISHING APPARATUS

Kenneth T. White, Chicago Heights, and Harold F. Roberts, Hawthorn Woods, both of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 27, 1980, Ser. No. 200,628
Int. Cl.³ A62C *37/06*
U.S. Cl. 169—19 **5 Claims**



1. An apparatus for pneumatically actuating slave devices in direct response to the discharge of a dry chemical fire extinguishant comprising:

at least one main fire extinguisher containing pressurized dry chemical fire extinguishant,

a main discharge pipe through which the pressurized dry chemical fire extinguishant from the main fire extinguisher passes,

a cartridge containing a pressurized gas supply connected to said main discharge pipe through an actuator valve,

said actuator valve comprising:

a resilient check having a tip portion urged into intimate contact with the valve walls by the pressurized gas supply to prevent said pressurized gas from escaping the actuator valve,

a piston reciprocally mounted in the actuator valve having a head disposed toward the main discharge pipe said head movable in response to pressure in the discharge pipe and fit into the actuator valve at sufficiently close tolerance to minimize gas transfer therethrough, said piston having a base portion facing the tip of the check and integrally connected with the head, such that depression of the piston head into the actuator valve releases the pressurized gas in the pressurized gas supply by forcing the tip of the check from its contact with the valve walls, and

a secondary discharge pipe through which the pressurized gas in the pressurized gas supply is released when the pressure against the piston head is greater than the pressure against the resilient check,

pneumatically responsive slave devices connected to the secondary discharge pipe, and

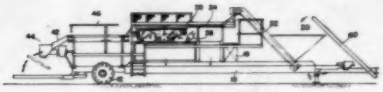
means for releasing the pressurized dry chemical fire extinguishant in the main fire extinguisher into the main discharge line to create a force in the main discharge line greater than the force against the resilient check.

4,373,589

HARVESTING APPARATUS FOR ONIONS

Yitzchak Hagiz, Givat Shmuel, Israel, assignor to Sharnoa Ltd., Petach Tikva, Israel

Filed Feb. 3, 1981, Ser. No. 231,114
Int. Cl.³ A01D *37/00;* **A23N** *15/04*
U.S. Cl. 171—31 **7 Claims**



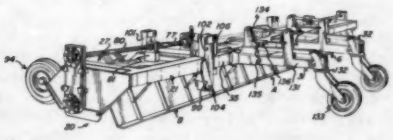
1. Mobile onion harvesting apparatus comprising:
driving means;
a wheeled chassis arranged to be coupled to said driving means;
a produce receiving hopper;
conveyor apparatus for raising produce from said hopper;
precleaning apparatus receiving onions from a conveyor apparatus, said precleaning apparatus including a generally planar array of spaced elements defining interstices therebetween and vibratory means coupled to said array for imparting vibration thereto, thereby to enhance the removal of debris through said interstices; and
trimming apparatus for receiving onions from said conveyor apparatus and trimming off the tops and bottoms of the onions, said trimming apparatus comprising an array of spaced elements, a plurality of rotary blade assemblies disposed thereunder and means for applying vibratory motion to said array with a vibration vector which is inclined upwardly with respect to said array such that trimmed onions are continually repositioned and roll or slide therealong.

4,373,590

TILLING APPARATUS

Michael C. Wittrock, Arvada, Colo., assignor to The Eversman Mfg. Company, Denver, Colo.

Filed Apr. 25, 1980, Ser. No. 143,609
Int. Cl.³ A01B *73/00, 33/02, 33/08*
U.S. Cl. 172—78 **24 Claims**



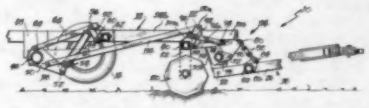
1. In a tilling implement, the combination comprising:
a tilling rotor supported for rotation by a support, said rotor including a rotor shaft and a plurality of axially spaced multiple tine and hub assemblies mounted on said rotor shaft at spaced intervals along said rotor shaft, each said assembly having a plurality of soil-working tines, each with a radially extending shank portion, and hoe portions that alternate to project axially in one direction and axially in the other direction, the hoe portions of adjacent of said assemblies overlapping to cut a width of soil; and
a rotor drive train on said support for transmitting rotary power from a power source to rotate said tilling rotor to work the soil through which said tilling rotor is advanced while rotated, said drive train including a central drive shaft and a cross drive shaft coupled to and extending laterally out from a side of said central drive shaft, said cross drive shaft being above and generally parallel to said rotor and coupled to said rotor shaft by a first coupling, said support, tilling rotor and rotor shaft being constructed as a central section and at least one wing section pivotally connected to a side of the central section to pivot about a first axis to move up and down to adjust to irregular soil contours, said first axis being in substantially the same horizontal plane as the axis of the rotor shaft of said central section to provide a minimum variation in tillage width for each row, said wing section being arranged to swing between a lowered working position and a raised position for transport.

4,373,591

IMPLEMENT AND LAST MOTION HITCH LOCKING MECHANISM THEREFOR

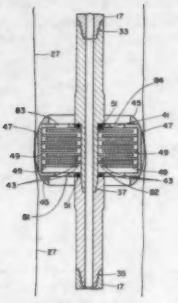
Wayne J. Schaaf, and Bennie J. Boswell, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Apr. 10, 1981, Ser. No. 252,850
Int. Cl.³ A01B *59/04*
U.S. Cl. 172—328 **16 Claims**



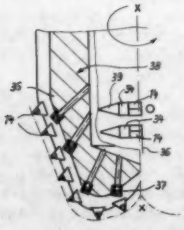
1. In an implement having a frame, a hitch bar pivotally connected to said frame for hinged movement relative to said frame, a rockshaft mounted on said frame for rotation about its longitudinal axis, and wheel means mounted on said rockshaft for movement between a lowered transport position wherein said frame is raised for transport and a raised position wherein said frame is lowered for an operating mode, the combination therewith comprising hitch lock means operatively associated with said wheel means and said hitch bar and adapted to maintain said hitch bar in fixed relation to said frame when said wheel means is in its said lowered position, said hitch lock means being adapted to enable hinged movement of said hitch bar relative to said frame when said wheel means is in its said raised position, said hitch lock means including first lost motion link means operatively associated with said hitch bar and adapted to limit downward hinged movement of said hitch bar to a first predetermined downward position when said wheel means is in its said lowered position while enabling upward hinged movement of said hitch bar to a second predetermined position when said wheel means is in its said raised position, and second lost motion link means interconnected between said wheel means and said hitch bar and adapted to prevent upward hinged movement of said hitch bar from said first predetermined position when said wheel means is in its said lowered position so as to lock said hitch bar in fixed relation to said frame, said first and second lost motion link means being cooperative in response to movement of said wheel means to its said raised position to enable upward and downward hinged movement of said hitch bar relative to said frame between its said first and second predetermined positions.

4,373,592
ROTARY DRILLING DRILL STRING STABILIZER-CUTTINGS GRINDER
Thomas B. Dellinger, Duncanville, and John Kelly, Jr., Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Nov. 28, 1980, Ser. No. 210,915
Int. Cl.³ E21B *12/00, 17/00*
U.S. Cl. 175—61 **13 Claims**



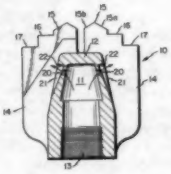
6. In extended reach drilling a wellbore having an inclination from a vertical of at least 60°, a method of rotary drilling a wellbore into the earth in a manner to mitigate differential sticking of a drill string having a drill bit at the lower end thereof, comprising drilling said wellbore by rotating a drill string comprised of sections of drill pipe connected together, and mitigating the tendency of the drill string to differentially stick in the borehole by providing a drill collar just above the drill bit and a stabilizer-grinder at a position just above the drill collar and along the drill string to grind and reduce the size of cuttings generated during the drilling operation.

4,373,593
DRILL BIT
Cornelius Phaal, Rivonia, South Africa, and Rainer Jürgens, Celle, Fed. Rep. of Germany, assignors to Christensen, Inc., Salt Lake City, Utah
Filed Mar. 10, 1980, Ser. No. 128,998
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910347
The portion of the term of this patent subsequent to Feb. 24, 1998, has been disclaimed.
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **12 Claims**



1. A rotary boring bit for boreholes, comprising a body which is provided on its outer periphery with cutting members each of which consist of a supporting portion and a cutting portion disposed on the supporting portion, each cutting member being formed as a wedge shaped cut-out segment of a sintered body with a supporting portion surrounding the cutting portion as a casing at least at the periphery, said cutting portion being a material selected from compacted diamond and compacted cubic boron nitride.

4,373,594
ROTARY DRILL BIT
Thomas R. Barr, P.O. Box 251, Denison, Tex. 75020
Filed Aug. 10, 1981, Ser. No. 291,759
Int. Cl.³ E21B *10/60*
U.S. Cl. 175—393 **4 Claims**



1. A rotary drill bit comprising:
a hollow body having a closed lower end and means on the upper end for securing the body to the lower end of a drill string;
a plurality of outwardly and downwardly extending cutting members on the exterior of and projecting laterally beyond the periphery of said body, said body having a plurality of flow passages, each of said passages opening downwardly and outwardly along a longitudinal axis between each two adjacent cutting members; and
deflecting means formed integrally with and exteriorly of said hollow body between each two adjacent cutting means for deflecting upwardly and away from said flow passages cuttings and the like to avoid plugging said passages during drilling, each longitudinal axis being oriented to direct fluid in a path to avoid contact with said deflecting means to permit unimpeded flow from said passages of all the fluid in said downward direction for cooling and lubricating said cutting members.

4,373,595
Patent Not Issued For This Number

4,373,596

WEIGHING APPARATUS WITH ELECTROMAGNETIC FORCE COMPENSATION

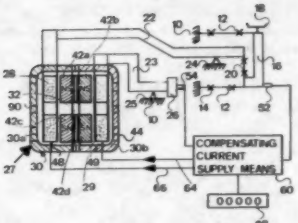
Peter Kunz, Saumstrasse 28, CH-8625 Gossau, Switzerland

Filed Aug. 14, 1981, Ser. No. 292,904

Claims priority, application Switzerland, Aug. 22, 1980, 6339/80

Int. Cl.³ G01G 7/00

U.S. Cl. 177—212 7 Claims



1. In a weighing system of the electromagnetic load compensation type including a frame (10), load receiving means (16) movably connected with said frame for vertical displacement from an initial no-load position upon the application of a load thereto, permanent magnet means (27) connected with said frame for producing a stationary magnetic field, load coil means (28) connected with said load-receiving means for vertical displacement in said magnetic field, reference coil means (28) connected with said frame for vertical displacement in said magnetic field from an initial null-position, means (52) for generating a load signal responsive to the displacement of said load-receiving means from its initial no-load position, means (54) for generating a reference signal responsive to the displacement of said reference coil from its null position, compensation current supply means (60) responsive to said load and reference signals for supplying compensating current to said load and reference coils to return the same to their initial no-load and null positions, respectively, and display means (68) responsive to said compensating current for affording a visual indication of the magnitude of the applied load;

the improvement wherein said permanent magnetic means comprises

(a) a hollow open-ended horizontally arranged sectional yoke housing including a pair of generally identical soft iron components (30*a*, 30*b*);

(b) a vertical divider wall (32) extending longitudinally between the ends of said housing for dividing the chamber contained therein into a pair of air gaps (48, 49); and

(c) at least one first permanent magnet (42*a*) mounted within a first opening (38*a*) contained in said divider wall, the polar axis of said magnet being normal to said divider wall;

(d) said load and reference coils being arranged in said air gaps on opposite sides of, and parallel with, said divider wall, respectively, whereby the direction of the magnetic flux extending through the lower portions of the coils is opposite to that of the flux extending through the upper portions of the coils.

4,373,597

TRACTOR FOR AGRICULTURE

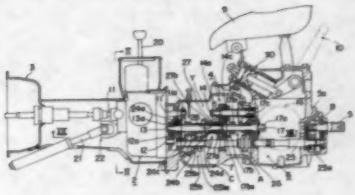
Hiroshi Itatani, Sakai; Masatsugu Tone, Hashimoto, and Kazuaki Kurohara, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 26,157, Apr. 2, 1979, abandoned. This application Feb. 12, 1981, Ser. No. 233,550

Claims priority, application Japan, Aug. 31, 1978, 53/107848

Int. Cl.³ B60K 17/06

U.S. Cl. 180—70 MS 7 Claims



1. A power transmission system for an agricultural tractor comprising:

a hydrostatic stepless speed change device (2) disposed rearwardly of a drive engine (1) and provided with a pump input shaft (11) and a motor output shaft (12), said pump input shaft (11) having a forward end portion for receiving power from said drive engine (1) and a rear end portion (11') extended rearwardly of and through said stepless speed change device (2), and said motor output shaft (12) being extended rearwardly of said stepless speed change device (2);

a travelling transmission means (4) including a gear type speed change mechanism;

a power take-off transmission means (6) operatively connected to said rear end portion (11') of said pump input shaft (11); and

a transmission changeover means (C) for causing said travelling transmission means (4) to operatively connect selectively to said motor output shaft (12) or to said power take-off transmission means (6);

wherein said transmission changeover means (C) is provided upstream of an input portion of said gear type speed change mechanism of said travelling transmission means (4).

4,373,598

AUXILIARY STEERING FOR MOTOR VEHICLES

Dieter Elser, Essingen-Lauterburg, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

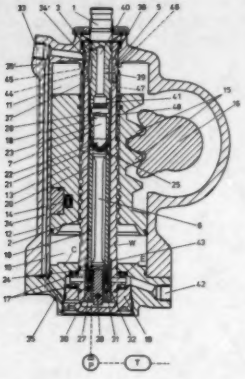
Filed May 7, 1980, Ser. No. 147,602

Int. Cl.³ B62D 5/08

U.S. Cl. 180—143 19 Claims

1. In a power steering device comprising a housing having a valved steering spindle therein comprised of two sections connected by a torsion rod (6) for return rotation to a neutral position and wherein one of the sections (1) is manually operable and carries a rotary valve plug (3) and the other of the sections (2) has a valve sleeve (5) encompassing and coacting

with said rotary valve plug for flow control to and from pressure chambers (**10, 11**) within said housing, upon relative rotation of said sections, a piston (**13**) in said housing movable between said pressure chambers to activate a steering mechanism, and drive means (W, etc.) intermediate said valve sleeve section and said piston; the improvement residing in road resistance simulating means which comprises: a reaction piston



(**20**) encompassing said torsion rod within said valve sleeve section and having an end adjacent an end of said steering spindle and rotation resisting means (**21, 22, 25**) comprising cam means intermediate said adjacent ends; and force means (**30**) acting on said reaction piston in axially spaced relation to said cam means remote from the rotary valve plug for exerting force against said steering spindle through said cam means upon rotation of said steering spindle to resist rotation thereof.

4,373,599

HYDRAULIC RACK STEERING SYSTEM

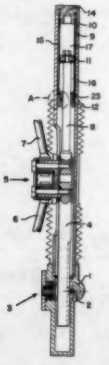
Wolfgang Walter, and Werner Breitweg, both of Schwabisch Gmund, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,214

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009051

Int. Cl.[3] **B62D** *5/10;* **F16J** *15/18*

U.S. Cl. 180—148 **5 Claims**



1. A hydraulic rack steering system having a servocylinder with a piston rod therein and being integrally connected to a rack with a pinion for driving the rack wherein said servocylinder comprises pressure chambers with a piston carried on said rod between said pressure chambers and including a seal assembly secured at an end of the servocylinder slidably engaging the piston rod;

the improvement wherein:

the seal assembly has a seal assembly housing (**12**) and within said housing a compressible sealing ring (**22**) surrounding a prestress ring (**21**) surrounding a further compressible sealing ring around a sealing ring of plastic material for engagement with a piston rod;

including a cover ring (**23**) secured within said seal assembly housing for retaining the aforementioned rings axially therein and being disposed with axial clearance (S) from said prestress ring to permit movement of said piston rod to follow bending of said rack under steering stress.

4,373,600

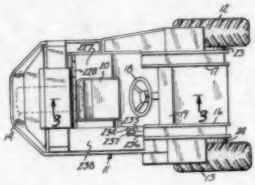
THREE WHEEL DRIVE VEHICLE

Floyd E. Buschbom, Long Lake, and Glen D. Hansen, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jul. 18, 1980, Ser. No. 170,145

Int. Cl.[3] **B62D** *6/06;* **B60K** *7/00*

U.S. Cl. 180—212 **29 Claims**



1. A vehicle comprising: a frame having a first portion and second portion, first wheels operatively connected to the first portion of the frame, fluid operated first motors, one of said first motors being drivably connected to one first wheel, the other of said first motors being drivably connected to the other first wheel, second wheel means operatively connected to the second portion of the frame, a fluid operated second motor drivably connected to the second wheel means, a pump assembly having a first pump for supplying fluid under pressure to the first motors, and a second pump for supplying fluid under pressure to the second motor whereby said first motors and second motor concurrently operate to drive the first wheels and second wheel means, means for operating said pump assembly, sub-frame means mounted on the frame, means mounting the pump assembly and means for operating said pump assembly on said sub-frame means, mount means releasably connecting the sub-frame means on the frame whereby the pump assembly, means for operating said pump assembly, and sub-frame means can be removed as a unit from the frame, means for rotatably mounting said second wheel means on said frame for angular movement about a generally upright axis, and means for angularly moving said second wheel means about said upright axis to steer said vehicle.

4,373,601

POWER TRANSMISSION DEVICE OF MOTORCYCLES

Takanori Onda, Kawagoe; Hiroshi Kawasaki, Tokorozawa, and Mitsukuni Misawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,365

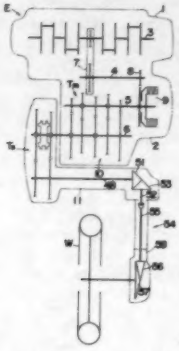
Claims priority, application Japan, Sep. 25, 1979, 54-123031

Int. Cl.[3] **B62M** *11/06, 17/00*

U.S. Cl. 180—226 **15 Claims**

1. A power transmission device for a motorcycle having an engine contained in a crank case and a rear wheel driven from the engine, said power transmission device comprising a main transmission case integrally formed with the engine crank case

and extending longitudinally rearwards thereof, a main transmission mounted in said main transmission case, a sub-transmission case disposed in part at one side in the transverse direction of said main transmission case, a sub-transmission mounted in said sub-transmission case and drivingly connected to said main transmission, said sub-transmission being disposed at said



one side in the transverse direction of said main transmission case, and means for drivingly connecting said sub-transmission to the rear wheel of the motorcycle, said means being disposed at the other side in the transverse direction of said main transmission case so that said means and said sub-transmission are transversely offset on opposite sides of said rear wheel.

4,373,602

POWER UNIT SUSPENSION SYSTEM FOR MOTORCYCLES

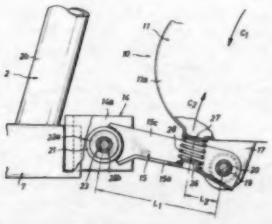
Takao Tomita, Niiza; Hitoshi Yamamoto, Shiki; Shigenaga Enoki, Wako; Isamu Goto, Kiyose, and Takeshi Hashimoto, Tachikawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 240,191

Claims priority, application Japan, Mar. 6, 1980, 55-28382; May 30, 1980, 55-72318; Jun. 2, 1980, 55-73852; Jun. 2, 1980, 55-73853

Int. Cl.³ B62K *11/04*

U.S. Cl. 180—227 **18 Claims**



1. In a motorcycle having a vehicle body frame and a power unit including an engine assembled integrally with a transmission and supporting an axle of a rear wheel, a suspension system for said power unit comprising:

link means having an axis in its longitudinal direction extending substantially at right angles to the direction of principal vibratory forces of said engine;

said link means being rotatable about a first pivot means while resiliently resisted, and about a second pivot means spaced apart in said longitudinal direction from said first pivot means;

said first pivot means being secured to said frame and said second pivot means being secured to a first front lower portion of said power unit;

whereby the entire rotational load acting on said power unit about said axle of said rear wheel is substantially converted into a moment of rotation of said link means;

first elastic means provided for said link means to elastically support said power unit, said first elastic means being arranged between an upper portion of said link means and a second front lower portion of said power unit;

said first elastic means being capable of producing a reaction force opposing said rotational load; and

means for supporting a rear portion of said power unit from an upper portion of said frame, said supporting means including shock absorbing means.

4,373,603

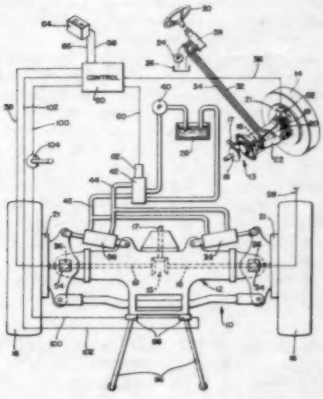
AUTOMATIC CRAB STEERING

Carl D. Nelson, Litchfield Park, Ariz., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 5, 1981, Ser. No. 240,698

Int. Cl.³ B60D *1/14*; B62D *9/02*

U.S. Cl. 180—236 **4 Claims**



1. A steering system for a tractor including a frame having a pair of front drive wheels and a pair of rear drive wheels;

steering means for controlling turning movements of said drive wheels;

implement draft arms mounted to said frame for connecting an implement to said tractor;

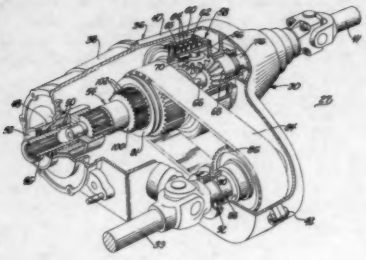
sensing means mounted to said implement draft arms for detecting side draft forces applied to said implement arms by an implement and producing an output signal in response to said side draft forces; and

control means including switch means having a plurality of positions respectively defining different modes of steering and one mode of steering being selectable wherein said drive wheels are automatically turned at equal angles in the same direction so that the longitudinal axis of the tractor moves in a generally sidewise direction, and said control means receiving said output signal and actuating said steering means when said one mode of steering is selected and in response to side draft on said implement draft arms above a predetermined level.

4,373,604
TRANSFER CASE

Royston C. Lunn, Ann Arbor; J. Edwin MacAfee, Grosse Ile; Robert C. Grabowski, Dearborn Heights; Dennis N. Renneker, Troy, and John M. Winkler, Temperance, all of Mich., assignors to American Motors Corporation, Southfield, Mich.

Filed Nov. 13, 1980, Ser. No. 206,338
Int. Cl.³ B60K *17/34*
U.S. Cl. 180—247 9 Claims



1. A transfer case for a four-wheel drive vehicle including a front axle and a rear axle and having a two-wheel drive mode and a four-wheel drive mode, the transfer case comprising:

a housing;

an input shaft mounted for rotation within the housing and adapted to connect to a source of drive torque;

a first output shaft and a second output shaft, each mounted for rotation within the housing;

coupling means for selectively coupling one axle through the first output shaft to receive drive torque when the vehicle is in its four-wheel drive mode, and not to receive drive torque when in its two-wheel drive mode, and wherein the other axle is coupled through the second output shaft to receive drive torque in either drive mode;

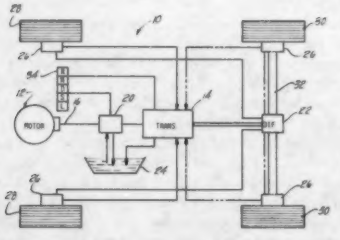
control means responsive to a control signal of a first character to couple the one axle through the first output shaft, and responsive to a control signal of a second character to decouple the one axle from drive torque; and

signaling means responsive to the position of the coupling means to provide a position indicating signal for feedback in controlling the actuation of the coupling means.

4,373,605
GEARLESS HYDRAULIC TRANSMISSION AND VEHICLE DRIVE SYSTEM

Darrel J. Sheppard, Sr., 28751 Delton, Madison Heights, Mich. 48071

Filed Jul. 1, 1980, Ser. No. 165,211
Int. Cl.³ B60K *17/10*
U.S. Cl. 180—308 19 Claims



1. In a vehicle having an engine with an output shaft, an accelerator to control said engine, and at least one driven wheel, a hydraulic device for selectively varying the torque output from the output shaft of said engine to said driven wheel, said device comprising:

a hydraulic fluid reservoir;

a torque motor operatively connected to said at least one driven wheel;

a hydraulic pump driven by said output shaft and drawing fluid from said reservoir to provide fluid at high pressure; and

fluid circuit means fluidly communicating said fluid at high pressure from said pump to said torque motor and returning to said reservoir to drive said at least one driven wheel and return, said circuit means having:

means positively controlled by said accelerator for selectively admitting fluid at high pressure from said pump to said torque motor,

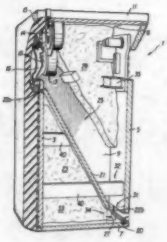
first means for varying the flow rate of said fluid between said torque motor and said admitting means thereby changing the torque applied to said driven wheel;

means for recirculating fluid to said torque motor without returning to said reservoir when fluid is not selectively admitted to said circuit means; and means disposed in said recirculating means for selectively restricting the flow of fluid recirculating to said torque motor.

4,373,606
LOUDSPEAKER ENCLOSURE AND PROCESS FOR GENERATING SOUND RADIATION

Philip R. Clements, 8710-R, Park La., Dallas, Tex. 75231, and Donald R. Smith, 4044 Buena Vista, #215, Dallas, Tex. 75204

Filed Dec. 31, 1979, Ser. No. 108,371
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—151 27 Claims



1. An improved loudspeaker enclosure for generating sound radiation in a room having a floor and a wall comprising;

a. a loudspeaker acoustically mounted therein for generating sound radiation, said loudspeaker having a rear piston radiating area of x;

b. a wall including a sound transmission port having a cross sectional area of between .3x and .65x for forming a sound radiation structure in combination with the room floor and room wall;

c. a bottom wall;

d. a tuned acoustical chamber for selectively absorbing sound radiation of the fundamental and even and odd harmonics of the system resonance frequency of the enclosure, said acoustical chamber including a sound radiation entrance port having a cross sectional area of y;

e. a compression chamber which is acoustically coupled to said rear piston radiation area of said loudspeaker, said chamber having a throat having a cross sectional area substantially equal to or less than x, and

f. an acoustical coupling for coupling said compression chamber throat with said sound transmission port and said sound radiation entrance port of said tuned acoustical chamber, said coupling having a top including said compression chamber throat, a bottom including said bottom enclosure wall, and a side including said transmission port.

4,373,607

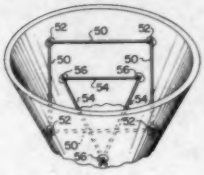
LOUDSPEAKER CONE STIFFENERS

Charles D. Miller, P.O. Box 790126, Dallas, Tex. 75379

Continuation-in-part of Ser. No. 63,379, Aug. 3, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 276,810

Int. Cl.³ H04R *7/00*

U.S. Cl. 181—166 **12 Claims**



1. An improved loudspeaker comprising:
a generally conical diaphragm,
acoustic driving means coupled to a small end of said diaphragm, and
a plurality of stiffener columns positioned in a plane essentially perpendicular to a central axis of said diaphragm and said columns having ends attached to said diaphragm intermediate said small end and a large end of said diaphragm, wherein said plurality of columns is positioned end to end to form a polygon.

4,373,608

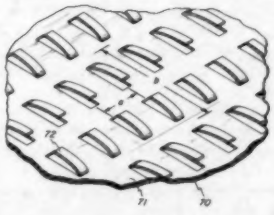
TUNED SOUND BARRIERS

David G. Holmes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,599

Int. Cl.³ H02K *5/24;* **F16F** *7/00;* **G10K** *11/16;* **H01F** *15/02*

U.S. Cl. 181—202 **13 Claims**



1. A tuned sound barrier for reducing the noise emitted by a vibrating source comprising:
a barrier sheet disposed adjacent said source; and
a plurality of resonators attached to and uniformly distributed over a major surface of said sheet; each one of said plurality of resonators being tuned to present to said barrier sheet a large mechanical impedance to vibratory motion of said barrier sheet at a specific frequency emitted by said source.

4,373,609

STAIRWAY STRINGERS CONSTRUCTED OF CAST, READILY-ASSEMBLED UNITS

Victor De Donato, 30 LeMoyne Ave., Pittsburgh, Pa. 15228

Filed Dec. 22, 1980, Ser. No. 218,939

Int. Cl.³ E04F *11/00*

U.S. Cl. 182—178 **10 Claims**

1. A readily-assembled stringer for constructing a stairway wherein the stringer is formed of a plurality of cast units assembled in a continuous, stepped relationship, each unit comprised of first and second arms and an intermediate member, each of said arms having an end integral with the intermediate member and a free end, said arms being substantially parallel and extending in the same direction and at substantially right angles from the intermediate member, said first arm having a recessed section open at the end of the arm integral with the intermediate member for snugly receiving the free end of the second arm of a first adjacent unit, said free end of the second arm being adapted to be snugly inserted in the recessed section of the first arm of a second adjacent unit, and means for securely fastening together the first and second arms of adjacent units.

4,373,610

SPEED CONTROL APPARATUS FOR ELEVATOR

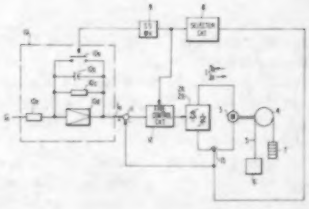
Toshiaki Ishii, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1981, Ser. No. 264,167

Claims priority, application Japan, May 28, 1980, 55-71267

Int. Cl.³ B66B *1/30*

U.S. Cl. 187—29 R **6 Claims**



1. A speed control apparatus for an elevator comprising: dual thyristor converters for converting A.C. electrical power into D.C. electrical power supplied to a D.C. motor driving an elevator car, said converters forming a non-circulating static Leonard device, a selector circuit (**8**) for producing a selection signal for switching between said dual thyristor converters to reverse the direction of current flowing to said D.C. motor, a signal generating circuit (**9**) for producing a signal in response to said selection signal, a current command changing circuit (**10**) for changing a current command signal based on the difference between a speed command signal for said elevator car and a signal proportional to the actual speed of said car in response to a signal from said signal generating circuit, and a firing angle control circuit (**12**) for generating a signal for controlling the firing angle of the converter thyristors as a function of the difference between a signal from said current command changing circuit and a detected current value of said D.C. motor, and a selection signal from said selector circuit, said current command changing circuit comprising an amplifier, and a filter circuit connected across said amplifier and formed by a resistor, a capacitor and resetting means connected in parallel, said resetting means functioning to reset said filter circuit in response to a signal from said signal generating circuit, said current command changing circuit serving to initially reduce the difference between the actual and commanded motor currents during transient switching periods of operation, and to thereafter limit the rate of change of said

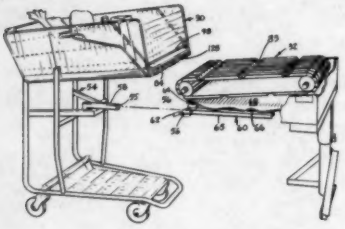
commanded motor current, and said signal generating circuit comprising a single pulse generator for producing a signal whose width is proportional to a time constant determined by the resistance and capacitance of said filter circuit, and which is of sufficient duration to enable the discharge of said capacitor.

4,373,611

CONVEYOR TO INTERFIT WITH A LOADED SHOPPING CART AND TO MOVE PORTIONS OF THE LOAD, ON DEMAND OF A CHECKER, TO THE FRONT OF THE CART, FOR REMOVAL, PRICE SCANNING, AND BAGGING, BY THE CHECKER AT A CHECKOUT STAND

Roderick J. Frederick, 1205 6th Ave. S., Seattle, Wash. 98134

Filed Oct. 1, 1980, Ser. No. 192,931
Int. Cl.³ A47B *46/00*
U.S. Cl. 186—64 **47 Claims**



1. In combination for installation and use in a market, a grocery cart for customers to load with their selected groceries, an unloading conveyor, sequentially and temporarily interfitted with arriving grocery carts, located immediately adjacent to a checkout stand, and operated by a checker to move the selected groceries to the front of the grocery cart to be conveniently picked up by the checker, and a checkout stand located nearby the end of the unloading conveyor, and related pricing, and money changing equipment, located within a convenient distance of the checker's sole location, comprising:

(a) a grocery cart having a basket with a bottom of equally spaced longitudinal members sloping upwardly and forwardly such that the forward portion of the bottom of the basket is raised slightly above the rear portion of the bottom of the basket and the longitudinal members define a plurality of parallel continuous unobstructed passages from rear to front along the bottom of the basket;

(b) an unloading conveyor having equally spaced longitudinal ribs adapted to extend up through and along the parallel unobstructed passages alongside the equally spaced longitudinal members of the bottom of the basket of the grocery cart, and which slope in a complimentary fashion parallel to the slope of the bottom of the basket at such an elevation that the ribs will pass through the parallel passages when the basket of the cart is positioned over the conveyor;

(c) the checkout stand positioned immediately adjacent the unloading conveyor, for receiving groceries just after they are removed from the basket, where the groceries have been moved forward, while resting upon the equally spaced longitudinal ribs of the conveyor belt; and

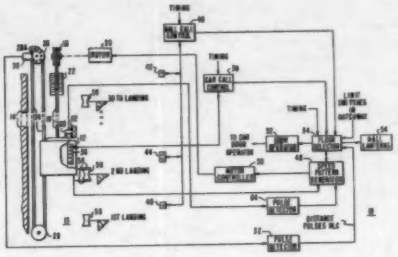
(d) the spaced longitudinal members forming the bottom of the basket being upturned at their forward ends to provide clearance above the longitudinal ribs and being transversely joined together at their ends by a cross member, such that the longitudinal ribs of the conveyor can readily pass beneath the cross member without interference.

4,373,612

ELEVATOR SYSTEM

William R. Caputo, Wyckoff, and Alan L. Husson, Hackettstown, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 25, 1980, Ser. No. 210,439
Int. Cl.³ B66B *1/30*
U.S. Cl. 187—29 R **6 Claims**



1. An elevator system, comprising:

a structure having a plurality of floors,

an elevator car mounted for movement in said structure to serve the floors,

motive means for causing said elevator car to make a run and stop at a target floor,

control means for said motive means, including speed pattern means for providing a speed pattern indicative of the desired speed of the elevator car during at least a portion of a run, and floor selector means,

said speed pattern means including first speed pattern means providing a running speed pattern which increases its magnitude from zero to a constant value to control the speed of the elevator car when the elevator car is to make a run and accelerate towards a predetermined constant velocity,

said floor selector means providing a slowdown signal when said elevator car reaches a predetermined distance from a target floor during a run,

said speed pattern means additionally including second speed pattern means providing a slowdown speed pattern in response to the issuance of said slowdown signal,

said first speed pattern means including:

(a) means providing a first deceleration signal in response to said slowdown signal,

(b) means responsive to said first deceleration signal which reduces the rate of change of the running speed pattern to zero, if its rate of change is not already zero when said slowdown signal is provided,

(c) first comparator means providing a second deceleration signal in response to a first predetermined relationship between said running and said slowdown speed patterns,

(d) means responsive to said second deceleration signal which reduces the magnitude of said running speed pattern at a predetermined constant rate of change, which rate is less than the predetermined constant rate of change of said slowdown speed pattern, and

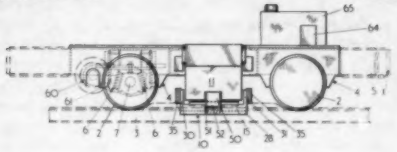
(e) second comparator means providing a transfer signal in response to a second predetermined relationship between said running and said slowdown speed patterns,

(f) and transfer means substituting said slowdown speed pattern for said running speed pattern in response to the issuance of said transfer signal, with said slowdown speed pattern controlling the speed of said elevator car following said substitution.

4,373,613
VEHICLE BRAKE EQUIPMENT

Cecil W. West, Caerphilly, Wales, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 24, 1981, Ser. No. 237,570
Claims priority, application United Kingdom, May 9, 1980, 8015448
Int. Cl.³ B61H 7/12
U.S. Cl. 188—43 13 Claims

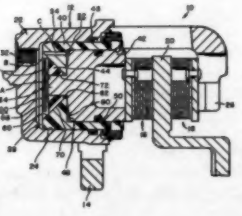


1. Vehicle brake equipment for a vehicle adapted to travel along a stationary rail, comprising a body component adapted to be mounted on the vehicle, brake means having a brake applied mode in which a brake member is urged towards the stationary rail with braking effort, and a brake release mode in which the brake member is not urged towards the stationary rail with braking effort, means for applying the braking effort to the brake member when, in use, the brake is applied, movable reaction means having one operational mode in which a reaction brake member is located on the opposite side of the stationary rail to said brake member and having a second operational mode in which the reaction brake member is clear of the stationary rail, drive means for urging the reaction brake member towards said one operational mode, and abutment means which are arrangeable to abut a stationary formation located along a section of the vehicle path and which when abutting the formation are arranged to override the action of the drive means to urge the reaction brake member towards said second operational mode in which the reaction brake member is clear of the stationary rail.

4,373,614
DISC BRAKE ASSEMBLY

Dean E. Runkle, LaPorte, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 27, 1981, Ser. No. 248,652
Int. Cl.³ F16D 55/224
U.S. Cl. 188—72.3 9 Claims

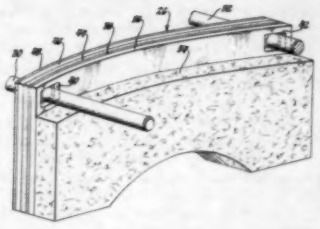


1. In a disc brake assembly having a pair of friction pads which cooperate with a caliper assembly to retard rotation of a rotor during braking, the caliper assembly defining a bore for receiving a piston assembly to substantially define a pressure chamber for receiving fluid pressure during braking, characterized by said piston assembly comprising a pair of pistons, said pair of pistons being movable relative to each other during braking and also during termination of braking, said pair of pistons cooperating to substantially define an auxiliary pressure chamber therebetween for receiving fluid pressure during braking and also cooperating to carry a resilient member therebetween, said resilient member cooperating with the fluid pressure within said auxiliary pressure chamber to substantially control the relative movement between said pair of pistons, a first seal cooperates with said pair of pistons to develop a first friction force when one of said pair of pistons is movable relative to the other piston a second seal cooperates with said other piston to develop a second friction force when said other piston is movable relative to said caliper assembly, and said first friction force is less than said second friction force.

4,373,615
LAMINATED DISC BRAKE PAD ASSEMBLY

Wolfgang Melinat, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1981, Ser. No. 228,707
Int. Cl.³ F16D 65/02, 69/02, 69/04
U.S. Cl. 188—73.1 2 Claims



2. A disc brake lining noise suppression system including a brake shoe and lining assembly comprising:

a first assembly section defined by a first brake shoe, a brake lining pad and a heat barrier secured together;

a second assembly section including a second brake shoe;

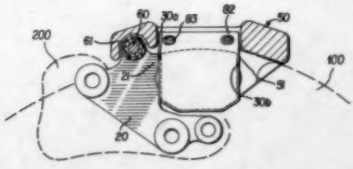
a rubber-like compound attached to and joining said first and second assembly sections and allowing said first assembly section to vibrate laterally and longitudinally relative to said second assembly section during brake application;

and mounting means mounting said shoe and lining assembly in a disc brake caliper and retaining said second assembly section against lateral and longitudinal vibration relative to the disc brake caliper while permitting lateral and longitudinal vibration of said first assembly section.

4,373,616
DISC BRAKES

Toshio Kondo, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 78,154, Sep. 24, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,186
Claims priority, application Japan, Sep. 28, 1978, 53-119609
Int. Cl.³ F16D 55/224
U.S. Cl. 188—73.45 2 Claims



1. A disc brake assembly for a wheel of a vehicle having a non-rotatable part comprising:

a rotatable disc plate secured to said wheel for unitary rotation therewith;

first and second friction pads for frictional engagement with a first and second side of said rotatable disc plate, respectively;

an adapter secured to said non-rotatable part of the vehicle, said adapter including a base portion extending in the radial direction with respect to said disc and being secured to said non-rotatable part of said vehicle by bolts, said adapter further including a first arm portion including a first hole, said adapter further including a second arm portion including a second hole;

caliper means including an opening for allowing said pads to pass therethrough and a fluid actuator disposed therein for moving said first and second friction pads into engagement with said disc plate, said caliper means being movably supported by said adapter and said pads being supported by said caliper means via supporting members extending therebetween, wherein said caliper means includes a cylinder portion, a reaction portion and two connecting portions at the top of said caliper means and connecting said cylinder portion and said reaction portion; wherein one of said connecting portions is provided with a recess opening to the outer circumferential surface of said disc, and wherein a second of said connecting portions is quadrilateral in section and is farther from said non-rotatable part of said vehicle than is said one of said connecting portions;

caliper supporting means secured to said caliper means and slidably supported by said adapter for guiding movement of said caliper means, said caliper supporting means comprising a pair of pins, one of said pins being positioned in, and protected by, said recess of said one of said connecting portions and in said first hole, the second of said pins being positioned radially below said cylinder portion of said caliper means and in said second hole;

said friction pads contacting said adapter at a first end portion thereof and directly contacting said caliper at a second end portion thereof opposite said first end portion, said second end portion comprising said first arm portion, to thereby receive braking torque exerted under a vehicle forward movement condition directly by said adapter and to receive braking torque exerted under a vehicle reverse movement condition by said caliper and said caliper supporting means.

4,373,617

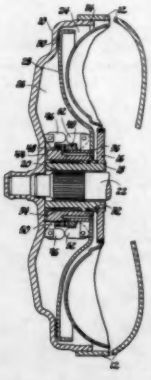
CONTROLLED SLIP TORQUE CONVERTER CLUTCH

Thomas P. Mathues, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1981, Ser. No. 269,344

Int. Cl.³ F16D *43/06*

U.S. Cl. 192—3.31 **4 Claims**



1. A control for a slipping clutch and torque converter drive comprising; an engagement chamber for said slipping clutch; a disengagement chamber for said slipping clutch; means for directing fluid to said engagement chamber and from said disengagement chamber; valve means disposed adjacent said slipping clutch for controlling fluid communication from said engagement chamber to said disengagement chamber; output speed sensitive control means rotatable with said slipping clutch and operating on said valve means to increase the fluid communication with increasing rotary speed of said slipping clutch thereby reducing the torque capacity of the slipping clutch and increasing the speed differential in said torque converter; and input speed sensitive control means rotatable with the input of said torque converter and operating on said valve means to decrease the fluid communication with increasing rotary speed of the input thereby increasing the torque capacity and decreasing the speed differential in said torque converter, said input and output speed sensitive control means interacting to maintain the slipping clutch slippingly engaged so that the slipping clutch and the torque converter share in the torque transmitted.

4,373,618

REVERSE SPEED SHIFT DEVICE FOR A MOTOR VEHICLE CHANGE-SPEED GEARBOX

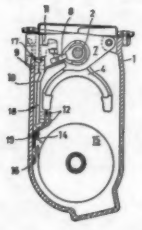
Gustav Sabel, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 17, 1980, Ser. No. 160,410

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933719

Int. Cl.³ B60K *41/20*

U.S. Cl. 192—4 B **2 Claims**



1. A reverse speed shift device for a change-speed gearbox having an after-running shaft and a selector shaft with a selector finger extending therefrom comprising:

a pivotably mounted check plate partially supported by the selector finger to cause rotation of the check plate as the selector finger is moved;

a pivotably mounted lever having first and second arms, the first arm being engageable by the check plate upon movement of the selector finger into the position for reverse gear engagement;

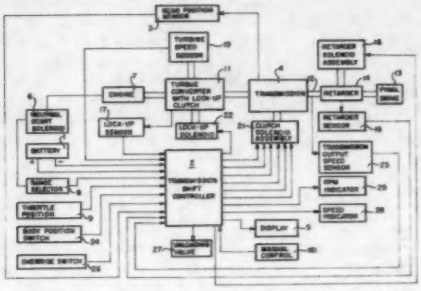
a pumping device mounted on the after-running shaft adapted to produce an oil stream flowing within the gearbox; and

a pivotably mounted baffle plate engaged by the second arm of the lever, the baffle plate being moveable from a rest position at which the flow of the oil stream is substantially unobstructed to a braking position at which the oil stream flow is substantially obstructed as the lever is pivoted upon engagement by the check plate through operation of the selector shaft whereby the over-running shaft is braked as the oil stream is obstructed.

4,373,619
TRANSMISSION CONTROL SYSTEM

Rosaldo F. Schritt, Bothell, and Martin J. Kenney, Redmond, both of Wash., assignors to Grad-Line, Inc., Woodinville, Wash.

Filed Apr. 7, 1980, Ser. No. 121,890
Int. Cl.³ B60K *41/06, 41/28*
U.S. Cl. 192—0.09 **8 Claims**



1. A control system for a multi-speed shiftable transmission, said transmission including a selectively operable speed range selector means for selecting a plurality of speed ranges, said plurality of speed ranges including a reverse speed range, a neutral range, and a plurality of forward speed ranges, a plurality of clutches selectively operable to provide different transmission output speed ranges, a transmission output shaft, and a torque convertor having a turbine and a lockup clutch therein, comprising:

first sensing means providing input signals indicative of a selected speed range for said transmission;

second sensing means providing input signals indicative of the actual speed range of said transmission;

third sensing means providing input signals indicative of the rotational speed of said turbine;

fourth sensing means providing input signals indicative of the rotational speed of said transmission output shaft;

means selectively actuating said plurality of clutches to shift transmission output speed ranges;

means for limiting the rotational speed of said transmission output shaft to a speed less than a predetermined speed;

means providing signals to selectively engage said lockup clutch to lock said torque convertor for direct drive; and

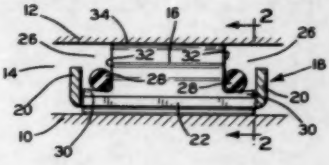
control means responsive to said input signals for providing control signals to actuate said lockup clutch and said plurality of clutches according to preset conditions to effect shifting of said transmission to said selected speed range, said control means including digital computing means and encoding means for connecting said input signals to said digital computing means, and means for inhibiting shifting when said lockup clutch locks said torque convertor for direct drive and means for inhibiting shifting when said means for limiting the rotational speed of said transmission output shaft is engaged.

4,373,620
ELASTOMERIC ENERGIZER FOR SPRAG CLUTCH

T. F. Zlotek, Warren, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 26, 1979, Ser. No. 88,449
Int. Cl.³ F16D *15/00, 41/07*
U.S. Cl. 192—41 A **8 Claims**

1. In a sprag clutch assembly including a pluralty of circumferentially spaced sprags, each sprag having a groove in at least one side thereof, the groove of each sprag being in alignment with the groove of each adjacent sprag, wherein the grooves define an annular recess in the pluralty of sprags in a plane perpendicular to the rotational axis of the sprag clutch assembly, an improvement comprising a sprag energizer of elastomeric material contained within said recess, said energizer being non-integrally molded with respect to said sprags, said energizer being of relative dimension as to occupy less than the

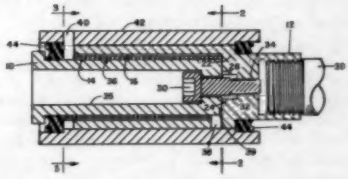


total volume of each groove, said energizer forming a band of resilient frictional contact over less than the total surface area of each groove, whereby said individual sprags do not apply bending moments to said energizer.

4,373,621
DRIVE MECHANISM EMPLOYING WRAPPED-SPRING CLUTCH AS RADIAL LOAD-BEARING MEANS

George A. Hellmer, 212 Thomas Ave., Maquoketa, Iowa 52060

Filed Nov. 7, 1980, Ser. No. 204,742
Int. Cl.³ F16D *13/02, 13/08*
U.S. Cl. 192—81 C **5 Claims**

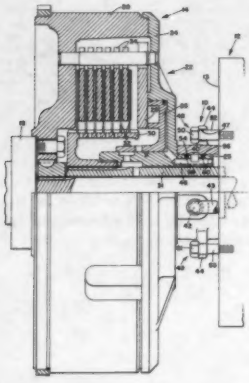


1. An externally-controlled, wrapped-spring clutch mechanism including a first rotatable member having an axially elongated cylindrical outer surface, a second rotatable member having an axially elongated cylindrical inner surface loosely telescoped over the first member outer surface so as to provide an axially elongated annular space between the two surfaces, a control element externally of and coaxial with the members, a coiled clutch spring contained within the annular space and wrapped around the first member and pre-loaded into engagement with the first member outer surface whereby one member drives the other, and said spring having axially opposite ends one of which is connected to the second member and the other of which is connected to the control element whereby the control element is selectively operative to relax the spring to discontinue drive between the members for enabling free relative rotation of the members, characterized in that the entire outer surface is formed as a minimum-friction bearing surface and the entire inner surface of the spring is formed as a minimum-friction helical bearing surface cooperative with the outer surface bearing area to freely inter-journal the two members for relative rotation when the control element is operated to relax the spring, said bearing surfaces comprising the sole radially-effective inter-journalling means between the members.

4,373,622
FLOATING MANIFOLD

Richard A. Michael, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 27, 1980, Ser. No. 200,858
Int. Cl.³ F16D 25/06; F16L 27/02
U.S. Cl. 192—85 AA 6 Claims



3. In combination with a stationary member, a rotatable clutch secured to a rotatable flywheel, a full annular piston enclosed in said clutch cover, said clutch comprising a rotatable clutch cover with an outward extending lip, a pressure plate indirectly connected to multiple clutch discs and actuated by said full annular piston, and a floating manifold positioned between said stationary member and said rotatable clutch, said floating manifold comprising:

(a) a circular collar annularly positioned on said outward extending lip of said rotatable clutch;

(b) passage means extending radially into said collar for conveying a hydraulic oil between said stationary member and said annular piston; and

(c) latching tongues mounted to the outer periphery of said circular collar capable of juxtapositioning said collar to said stationary member, said latching tongues limiting rotational movement in one direction of said circular collar on said outward extending lip while permitting limited axial movement of said circular collar on said outward extending lip relative to said stationary member.

4,373,623
SILO DISCHARGE CHUTE

George B. Bruecker, Rte. 1, Greenleaf, Wis. 54126

Filed Apr. 2, 1981, Ser. No. 250,456
Int. Cl.³ B65G 11/02
U.S. Cl. 193—14 12 Claims

1. In silo discharge chute forming means comprising:

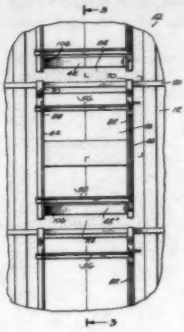
A. at least one inwardly bowed door for straddling an upright opening in the wall of a silo; and

B. support means to removably support each door astride said opening;

the improvements wherein:

C. each door comprises at least two vertically divided segments having a combined width greater than the width of said opening and an individual width less than the width of said opening; and

D. said support means for each door comprises a vertically registered pair of normally horizontally supported U-shaped members, each member having a pair of legs for pivotal attachment to said wall on each side of said opening and a bight normally extending radially inward and pivotally retractable radially outward through said opening, and fastening means fixed to the upper and lower ends

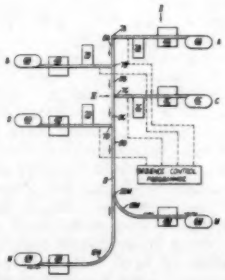


of each door to engage the bights of said pair of U-shaped members.

4,373,624
CIGARETTE CONVEYOR SYSTEMS

Desmond W. Molins; Dennis Hinchcliffe; Frank Heybourn, and Raymond G. Coyte, all of London, England, assignors to Molins Limited, London, England

Division of Ser. No. 865,212, Dec. 28, 1977, Pat. No. 4,280,611, which is a continuation-in-part of Ser. No. 633,714, Nov. 20, 1975, abandoned. This application Mar. 18, 1981, Ser. No. 245,160
Claims priority, application United Kingdom, Nov. 27, 1974, 51321/74
Int. Cl.³ B65G 1/00
U.S. Cl. 198—347 11 Claims



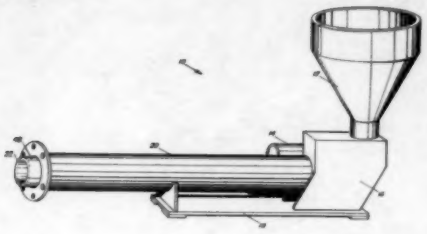
1. A cigarette making system including a number of units each comprising a cigarette making machine, a cigarette packing machine, a reservoir which accommodates differences between the rates of cigarette supply and demand, and linking conveyor means for connecting said cigarette making machine to said cigarette packing machine and said reservoir within the unit characterized in that the output of the cigarette making machine in each unit is greater than that of the associated packing machine, and that the system includes an additional packing machine which is not directly associated with a making machine, and additional transfer conveyor means which communicates with each of said linking conveyor means in said units for deliverying surplus cigarettes from the cigarette making machines to the additional packing machine.

4,373,625

DOUBLE-WALLED ROTARY TUBULAR CONVEYOR WITH STABILIZING DRIVE MEANS

Ronald S. Parsons, 15 Fieldhedge Dr., Somerville, N.J. 08876

Filed Sep. 30, 1980, Ser. No. 192,484
Int. Cl.³ B65G 17/00
U.S. Cl. 198—804 7 Claims



7. A tubular conveyor apparatus comprising:

a first double-walled rotary tubular driven conveyor including at least a first drive means therefor, said first conveyor having a continuously circular cross-section;

at least a second double-walled rotary tubular driven conveyor including at least a second drive means therefore synchronized with said first drive means, said second conveyor having a continuously circular cross-section;

and,

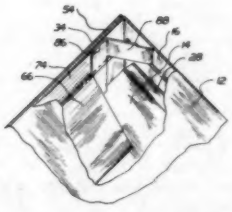
a tube skipping conveyor completely surrounding said first and second double-walled rotary tubular conveyors, said tube skipping conveyor having a continuously circular cross-section.

4,373,626

CARTON FOR CARDED PRODUCT

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 2, 1980, Ser. No. 155,439
Int. Cl.³ B65D 81/00, 25/54, 85/30
U.S. Cl. 206—45.14 11 Claims



1. A carton for supporting a card with a product mounted on a face thereof to space the product from the carton structure including:

a substantially planar back face panel;

a first side wall panel hinged to a first side edge of said back panel;

a front face panel hinged to said first side wall panel along the edge thereof opposite said back face panel, said front face panel extending substantially parallel to said back face panel and being substantially identical in size and shape to said back face panel;

a second side wall panel hinged to the side edge of said front face panel opposite said first side wall panel, said second side wall panel hinged to the side edge of said back face panel opposite the first side edge thereof;

a first pair of end closure panels, one each hinged at opposite ends of said back face panel;

a second pair of end closure panels, one hinged at opposite ends of said front face panel;

a first pair of end closure flaps, one each hinged at opposite ends of said first side wall;

a second pair of end closure flaps, one each hinged at opposite ends of said second side wall;

a pair of end support flaps, one each hinged to and folded back on the adjacent end closure panel of one of said pairs of end closure panels, said end support flaps extending inwardly and angularly engaging the face panel to which its respective adjacent end closure panel is hinged;

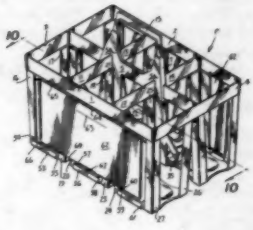
and means at each carton end to maintain the product and the card end at that carton end spaced from said face panel opposite the face panel in engagement with the end support flap at that carton end.

4,373,627

ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 34,429, Apr. 30, 1979, abandoned, which is a division of Ser. No. 893,190, Apr. 3, 1978, abandoned. This application May 15, 1980, Ser. No. 150,204
Int. Cl.³ B65D 75/00
U.S. Cl. 206—201 7 Claims



1. An article carrier formed in a rectilinear arrangement and comprising a frame structure, a plurality of struts depending downwardly from said frame structure and arranged in at least two groups, a bottom element secured to the lower edges of each group of struts to form a pair of article receiving cells, a partition element disposed between and secured to two adjacent struts of one group of struts and forming a partition between said cells, the midportion of said partition element being transversely yieldable, a base strap interconnecting the lower portions of two adjacent struts of at least one group, said base strap projecting outwardly of said carrier with respect to said two adjacent struts, and a promotional insert being associated with one side of said carrier and including a retaining tab integrally joined to the lower edge of said insert and disposed in overlapping relationship with the inner surface of said base strap.

4,373,628

WOODWORKING PLANE HOLDER

Christopher Dantes, 40 Kale Rd., Rocky Pt., N.Y. 11778

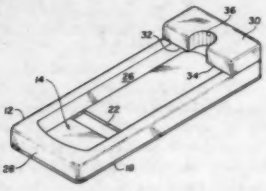
Filed Jun. 8, 1981, Ser. No. 271,538
Int. Cl.³ B65D 61/00
U.S. Cl. 206—349 4 Claims

1. A wood-working plane holder comprising:

a flat rectangular base structure, said base having a rectangular cut-out portion transverse to said base and shaped and located therein to receive the blade of a plane;

a hollow rectangular enclosure attached to said base and

forming therewith a cavity of predetermined size to receive a plane; and



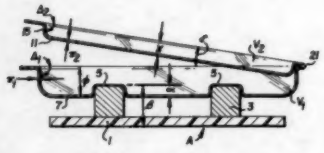
a cover for the cavity attached to said rectangular enclosure at one end thereof so that the cover overlies a portion of the cavity at said one end.

4,373,629

USED SURGICAL SHARPS CONTAINER WITH RE-USABLE MAGNETIC BASE

Roy A. Ulin, Wyckoff; Ted Foley, West Milford, both of N.J., and Hasmukh Shah, Bombay, India, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 9, 1981, Ser. No. 271,873
Int. Cl.³ A45C *11/26*
U.S. Cl. 206—350 **22 Claims**



1. A container for storing sharps, comprising:

(a) base means formed of a reuseable and sterilizable material, said base means having a platform and at least one rib of magnetic material fixed to said platform and projecting upwardly from said platform to engage collecting means;

(b) collecting means for surgical needles or blades, said collecting means having at least one inverted recess to engage said at least one rib of said base means, said at least one inverted recess and at least one rib dimensioned in such a way to provide a reversibly interlocking frictional fit between said collecting means and said base means so as to make said collecting means disposable by removing said from said base means; and

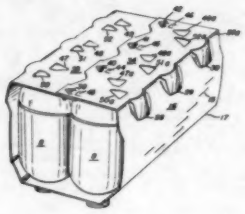
(c) cover means with said collecting means to form an enclosure, said cover means capable of tight-fitting engagement with and placement over said collecting means to prevent said sharps from escaping from said enclosure when said cover means are in tight-fitting engagement with said collecting means, said collecting means and said cover means attached to each other by hinge means, said collecting means being provided with locking means to lock said cover means with said collecting means when said cover means is in tight-fitting engagement with said collecting means.

4,373,630

WRAPAROUND ARTICLE CARRIER WITH ADJUSTABLE GIRTH

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 25, 1982, Ser. No. 342,400
Int. Cl.³ B65D *71/00, 85/62*
U.S. Cl. 206—434 **5 Claims**



1. In an article carrier of the wraparound type formed from a blank of generally rectangular configuration and having lap panels at its outer ends which are overlapped and secured together in flat face contacting relation in alternate relative positions of long and short overlaps to form tubular structures of different girths respectively, an improved tightening means comprising at least one pair of tightening apertures formed respectively in said lap panels for receiving machine tightening elements operable to impart tightening action to said blank when disposed about a group of articles, said one pair of tightening apertures being spaced a predetermined distance from one longitudinal edge of said blank, and a second pair of tightening apertures formed respectively in said lap panels for receiving machine tightening elements operable to impart tightening action to said blank when disposed about a group of articles, said second pair of tightening apertures being spaced said predetermined distance from the longitudinal edge of said blank which is opposite from said one longitudinal edge thereby to adapt the carrier blank for transverse orientation in different positions relative to the associated group of articles by rotating the blank when disposed in a horizontal plane through an angle of 180° about a vertical axis, said second pair of tightening apertures being spaced from each other in a direction longitudinally of the blank by a distance which is different than the spacing between said one pair of tightening apertures in a direction longitudinally of the blank thereby to adapt the carrier for packaging article groups comprising articles of different sizes, said pairs of apertures being arranged in staggered relationship with respect to each other.

4,373,631

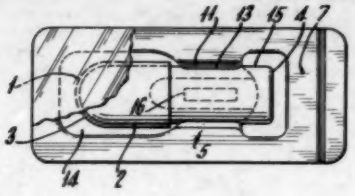
TAMPON PACK ESPECIALLY FOR A COATED TAMPON CONTAINING MEDICAMENTS

Axel Friese, and Frantisek Simunek, both of Wuppertal, Fed. Rep. of Germany, assignors to Dr. Carl Hahn G.m.b.H., Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 126,593, Mar. 3, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 332,687
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916564
Int. Cl.³ A61F *13/20*; B65D *81/02, 57/00*
U.S. Cl. 206—438 **6 Claims**

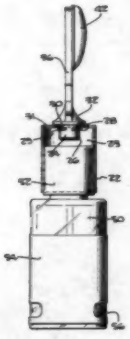
1. A tampon pack for containing and protecting a cylindrical tampon having a coated insertion end and an uncoated rear end, said pack walls provided with at least one constriction in the zone adapted to contain the rear end of the tampon whereby said tampon may be held with the coated insertion end out of substantial contact with the container walls; said tampon pack in the form of an elongated blister pack having a body portion and a cover wherein the transverse cross-section of the constriction is essentially in the form of a segment of a

circle with a trapezoid placed thereon; said trapezoid having its shorter parallel side coincident with the imaginary secant of



said segment, and its longer parallel side formed by the cover of the blister pack.

4,373,632
NAIL POLISH HANGER
John M. VanZandt, 15932 Northfield, Pacific Palisades, Calif. 90272
Filed Feb. 19, 1981, Ser. No. 236,288
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—457 **5 Claims**



1. An apparatus for suspending a container from a cap removably attached to said container comprising:

(a) sheath means, encircling said cap, for attaching said apparatus to said container, said sheath means including a bore disposed over said cap; and

(b) hanger means, rotatably attached to said sheath means at said bore and including an arcuate opening for positioning over a point of support, for rotatably suspending said sheath means and said container from said point of support, said hanger means including:

(1) a substantially flat and elongated member, having a cutaway area therein defining said arcuate opening;

(2) a flange disposed at one end of said elongated member, said flange being disposed adjacent said bore in said sheath means and being larger in area than said bore;

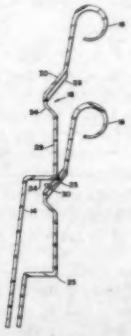
(3) a shaft member extending outwardly from said flange and having a cross section substantially identical to that of said bore, said shaft being positionable within said bore; and

(4) thread means, disposed on said shaft, for maintaining said hanger means rotatably attached to said sheath means after said shaft member is placed in said bore and said thread means is urged past said sheath means.

4,373,633
STACKABLE CAN
Milton F. Lutz, Sr., 5906 Wolf Lake Rd., Grass Lake, Mich. 49241
Filed Sep. 14, 1981, Ser. No. 301,454
Int. Cl.³ B65D *21/02*
U.S. Cl. 206—508 **2 Claims**

1. An end for a can characterized by its ability to interrelate with a similar can end to facilitate the vertical stacking of cans comprising, in combination, a substantially flat sheet metal member having an axis, a general plane of configuration perpendicular to said axis, an inner side, an outer side and a periphery, an annular ridge defined on said member from the material thereof axially extending from said general plane on said outer side concentric to said member axis and radially spaced inwardly of said periphery, said ridge including a flat support surface substantially parallel to said member general plane comprising the maximum axial extension of said ridge from said member general plane, a plurality of axially extending rounded and concave recesses defined in said ridge support surface, a plurality of axially extending rounded and convex projections defined in said ridge support surface complementary in configuration and dimension to said recesses, said recesses and projections being at an equal radial distance from said member axis and of a diameter less than the radial dimension of said support surface and spaced from each other in non-intersecting relationship, said recesses and projections being angularly spaced about said member axis upon said ridge support surface in an alternating relationship, and an annular flat ring defined on said member within the general plane thereof intermediate said periphery and said ridge.

4,373,634
RESILIENT NESTABLE CUP
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jan. 19, 1981, Ser. No. 225,954
Int. Cl.³ B65D *21/02*
U.S. Cl. 206—520 **5 Claims**



1. One-piece nestable cup of thin wall plastic construction comprising a bottom wall and side wall integral therewith tapering upwardly and outwardly therefrom, the upper margin of the sidewall having thickened rim means of predetermined axial extent, said side wall having circumferential stacking ring means formed therein positioned below said upper margin and

adjacent the bottom wall and having an axial extent greater than the axial extent of the thickened rim means, said stacking ring means having, at its lower extremity, circumferentially disposed externally projecting shoulder means and having, at its upper extremity, circumferentially disposed internally projecting shoulder means of smaller minimum diameter than the maximum diameter of said external shoulder means and spaced upwardly therefrom, said internal shoulder means adapted to form a shelf to co-act with the complementary external shoulder means of a like container to positively limit the extent of telescopic association of said like containers, supporting strut portion located between the internally projecting shoulder means and externally projecting shoulder means, the strut portion tapered downwardly and outwardly toward the bottom wall of the axial uppermost extremity of the strut extending inwardly of the axial lowermost extremity of the strut, one of said shoulder means presenting a co-acting first surface means extending in a plane generally perpendicular to the central axis of the cup, and the other of said shoulder means including a generally bulbous co-acting second surface means adapted to extend toward a first support of a telescopically associated like container, the bulbous second surfacing being of significant surface area relative to the surface circumferential area of the remainder of the shoulder means upon which it is formed whereby limited contact between said first and second co-acting surfaces transforms into substantial contact in the plane of the first surface means due to the resilient compression of the bulbous surface upon axial force exerted on the stack of cups, the first and second co-acting surface and strut portion creating two co-acting spring means which cooperate to overcome the effect of shock loading on a stack of nested containers.

4,373,635

FILTERS

Robert S. Mules, Talbot Green, Wales, assignor to Fram Europe Limited, Glamorgan, Great Britain

Filed Sep. 30, 1981, Ser. No. 307,043

Claims priority, application United Kingdom, Sep. 23, 1980, 8030554

Int. Cl.³ B65D *85/84*

U.S. Cl. 206—525 **3 Claims**

1. In a combination filter cartridge and shipping tray for protecting the filter cartridge, said filter cartridge comprising an array of transversely folded pleats having a pair of opposite ends, the ends of each of said pleats being sealed, a perimetrical strip of sealing material extending around said array for sealing said filter cartridge in use, said shipping tray having an upstanding side wall extending around said cartridge and a raised center portion cooperating with said side wall to define a trough extending around the perimeter of said tray, said trough molding said sealing material into a predetermined shape, the upstanding wall of said tray defining a cavity receiving said filter cartridge and permitting the latter to sealingly engage with the sealing material in said trough when the filter is manufactured whereby the sealing material hardens into a seal carried on said cartridge when the tray is removed from the cartridge, said tray protecting both said seal and said array of pleats, and a protective frame enclosing at least a portion of said array of pleats, said frame including a perimetrically extending portion projecting from said pleats, said projecting portion being embedded in said sealing material.

4,373,636

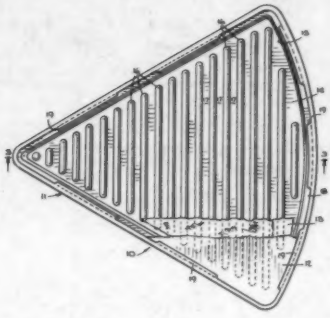
CONTAINER

Louis S. Hoffman, Evan Farm Rd., Morris Township, Morris County, N.J. 07960

Filed Feb. 18, 1981, Ser. No. 235,754

Int. Cl.³ B65D *85/72*; A45C *11/20*; A23B *7/14*; B65D *51/16*

U.S. Cl. 206—551 **27 Claims**



1. A container for pizza comprising

a tray of predetermined geometric shape having a base, a peripheral wall defining a chamber and a plurality of raised elongated ribs on said base for receiving pizza thereon while defining airflow passages therebetween; and

a cover removably mounted on said wall of said tray to enclose said chamber.

4,373,637

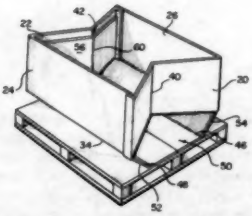
COLLAPSIBLE PALLET MOUNTED CONTAINER

Joseph C. Shippell, Montrose, Mich., assignor to Consolidated Packaging Corporation, Flint, Mich.

Filed Nov. 30, 1981, Ser. No. 325,579

Int. Cl.³ B65D *19/00*

U.S. Cl. 206—600 **13 Claims**



1. A collapsible container assembly comprising:

a horizontal rigid pallet base;

four flexible interconnected wall panels comprising two opposite side panels and two opposite end panels;

a container floor with at least two floor score lines parallel to each other dividing the floor to define a central portion and outer portions of each side of and connected to the central portion;

the container floor being integrally and flexibly connected at the outer edges of the outer portions to the bottom edges of the two opposite side panels by means of a pair of side score lines;

the central portion being affixed to the rigid pallet and the outer portions being foldable along the floor and side score lines;

vertical score lines dividing the two opposite end panels into two sections, whereby the two sections on each side of the

vertical score lines on each of the two opposite end panels are foldable inwardly along the vertical score lines from an opened position to a collapsed position;

the floor score lines and the side score lines and the vertical score lines all forming flexible connections allowing the container to be collapsed in a flattened configuration above the pallet for storage.

4,373,638

SORTING APPARATUS

Mark A. Schapper, Ivanhoe, Australia, assignor to Sphere Investments Limited, Nassau, The Bahamas

Filed Jan. 2, 1981, Ser. No. 222,070

Claims priority, application South Africa, Jan. 24, 1980, 80/0429

Int. Cl.³ B07C 5/00, 5/344

U.S. Cl. 209—570 **17 Claims**

1. Sorting apparatus for sorting objects according to the degree to which they possess a certain characteristic, comprising feed means operable to feed objects to be sorted in a stream in which the objects are spaced apart from one another and along a path which comprises a free flight trajectory; means to measure a characteristic of the objects as they move in said stream; and means selectively to deflect individual objects from said free flight trajectory according to the measure of said characteristic obtained for those objects; wherein said feed means comprises a pair of movable elements having surfaces defining an upwardly facing nip, means to feed the objects to be sorted downwardly into said nip and drive means to move said elements such that said surfaces move downwardly at the nip so as to grip the objects and accelerate them downwardly and subsequently to project them downwardly into free flight such that said free flight trajectory is substantially vertical.

4,373,639

SUPPORTIVE ANGLE HOLDING MEANS AND STRUCTURE CLAMPING MEANS FOR STORAGE DEVICES

Alfred J. Tricon, 9654 Winsome La., Houston, Tex. 77063

Filed Jul. 16, 1980, Ser. No. 169,290

Int. Cl.³ A47F 7/00

U.S. Cl. 211—86 **6 Claims**

1. An apparatus for tiltably connecting a storage device to a drafting table and the like, comprising:

a first threaded rod member,

a second threaded rod member aligned with and spaced from said first rod member and having an eye portion at one end,

a first bar member slidably disposed about said rod members,

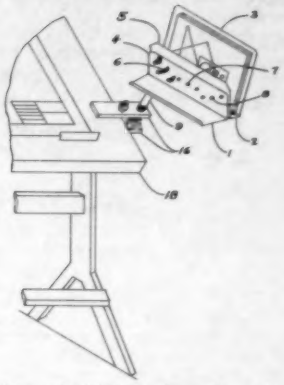
a second bar member slidably disposed about said rod members and alignedly spaced from said first bar member,

a first pair of nut members each threadedly and compressively disposed on said first rod member for urging one of said bar members toward the other of said bar members,

a second pair of nut members each threadedly and tensionally disposed on said second rod member for urging one of said bar members from the other of said bar members,

support means for storing and holding selected objects, and

connector means for pivotally interconnecting said support means with said eye portion of said second rod member for positioning said support means independently relative



to the positions of said first rod member and said bar members.

4,373,640

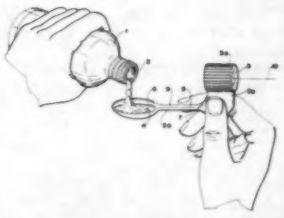
MEDICINE BOTTLE ACCESSORY

George F. Resio, 212 Mary St., Old Forge, Pa. 18518

Filed Aug. 26, 1977, Ser. No. 827,852

Int. Cl.² B65D 41/26, 51/24, 55/00

U.S. Cl. 215—228 **3 Claims**



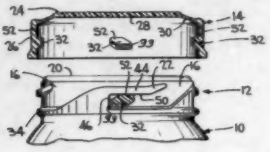
1. A medicine bottle accessory for a medicine bottle having an open top, said medicine bottle accessory comprising

a bottle top of generally cup type configuration removably affixed to the bottle at the top thereof for selectively opening and closing the open top of the bottle, and a spoon integrally formed with the bottle top and extending therefrom whereby a consumer of medicine from the bottle having a contagious illness prevents the spread of his illness by utilizing the spoon to convey medicine from the bottle to his mouth, said spoon having an elongated stem having spaced opposite first and second ends and extending from the bottle top and forming a finger grip at its first end, and an open receptacle extending from the second end of the stem, said stem being of substantially L-shape having a first part in the area of the first end thereof substantially coplanar with a diametrical plane through the bottle top and a second part in the area of the second end thereof substantially perpendicular to the first part of the stem and in spaced substantially parallel relation with the axis of the bottle top.

4,373,641
PLASTIC CLOSURE AND RELATED CONTAINER FINISH

John N. Banich, Sr., Chicago, and Donald H. Zipper, Western Springs, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Mar. 9, 1981, Ser. No. 241,972
Int. Cl.[3] B65D *41/06*
U.S. Cl. 215—331 4 Claims

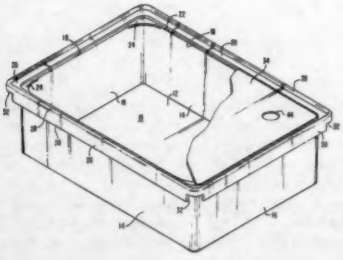


1. A closure and neck finish combination, said neck finish having a terminal sealing surface and including a plurality of thread segments projecting radially from a container neck, said closure being formed of a plastic material and including an end panel for sealing engagement with said terminal sealing surface and a depending skirt, said skirt having radially inwardly directed lugs for underlying said thread segments and retaining said closure on said neck finish; the improvement comprising said neck finish including a support surface on said neck below said thread segments, and said skirt having an internal surface area for engaging said support surface for preventing distortion of said skirt due to the loading of said lugs, said thread segments and said lugs having mating surfaces sloping radially outwardly and axially upwardly at a maximum angle of 10° to the axis of said neck.

4,373,642
MATERIAL HANDLING TOTE

Richard H. Wolters, Grand Rapids; William C. Anderson; Charles R. Tyke, both of Cascade, and Charles P. Schreiner, Saugatuck, all of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1980, Ser. No. 212,946
Int. Cl.[3] B65D *1/22, 6/34, 21/02*
U.S. Cl. 220—72 9 Claims



1. A material handling tote comprising:

a bottom wall, a pair of side walls and a pair of end walls defining an open top container;

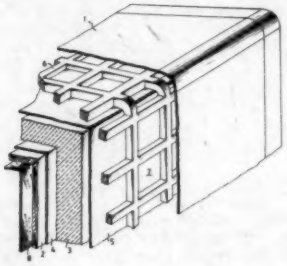
a continuous flange extending outwardly from the upper edge of said side walls and said end walls, said continuous flange having at its outer edge a vertical flange having an upper portion extending above said continuous flange and a lower portion extending below said continuous flange, said lower portions being substantially equal in length to their adjacent end and side walls thereby providing open corners for lateral access to the space between said end walls and said side walls and their adjacent lower portions of said vertical flange; and

a plurality of raised ribs on the inner surface of the lower portions of said vertical flange, said raised ribs constructed and arranged to spread the load equidistantly across said vertical flange when said material handling tote is hung from a support rail.

4,373,643
TRANSPORT CONTAINER

Joachim Przytarski, Berlin, Fed. Rep. of Germany, assignor to KTS, Kunstoff-Technische Spezialfertigungen Anni Przytarski, Berlin, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,348
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3114174
Int. Cl.[3] B65D *25/14, 90/04, 90/06*
U.S. Cl. 220—450 6 Claims



1. A lightweight transport container for transporting goods which are sensitive to humidity and temperature changes, of the type composed of walls and at least one lid, the improvement comprising:

said walls and lid each being composed of a plurality of layer zones which are coordinated with each other with respect to their operating characteristics, including an inner layer zone comprising a rigid, moisture-storing material, a heat-insulating material layer zone disposed atop said inner layer zone which is covered on both its inner and outer sides with a water impermeable foil, a wide mesh-like grid structure which rests on the foil covering the outer side of said heat-insulating material layer zone and forms a plurality of air chambers, and an outer wall for said transport container which covers said grid structure.

4,373,644
CHILD RESISTANT TYPE TRIGGER ACTUATED PUMP DISPENSER

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

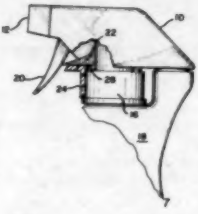
Filed Feb. 17, 1981, Ser. No. 234,928
Int. Cl.[3] B05B *11/00*; G01F *11/04*
U.S. Cl. 222—153 10 Claims

1. A device for use with a manually operable trigger pump having a pump body and a circular cap disposed below the body and adapted to engage a container having material to be pumped out by said pump, said pump having a generally vertical trigger pivotally coupled at its upper end to said body and a linkage coupled at one end to said trigger at a point intermediate the ends of the trigger, said linkage extending inclinedly upwardly upwards from said coupled end into said body, said linkage being moved into said body when said trigger is pivoted in a vertical plane toward said body to operate said pump, said device comprising:

locking means securable to the outer surface of said cap in

such manner as to be manually rotatable about said cap; and

a generally horizontal arm integral at one end with said locking means and when said means is secured to the cap extending radially outward from said cap, said arm having in its top surface a radially extending recess, said means when secured to said cap being rotatable to a locked position at which the other end of the arm is aligned with but is inwardly spaced from the trigger and said linkage engages said recess, the separation between said trigger and the other end of said arm, when the means is in locked



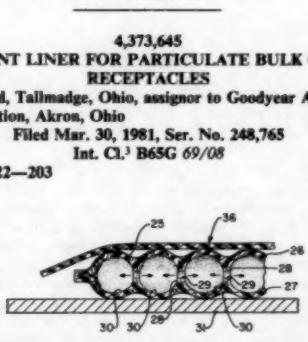
position, being large enough to allow sufficient pivotal movement of the trigger toward the pump body to raise the linkage partially out of engagement with the recess and small enough to prevent trigger operation of the pump, whereby the pump is locked into an inoperative position, said pump being unlocked and in operative position when the trigger is pivoted inwardly to partially disengage the linkage in the recess and the locking means is simultaneously rotated to move the other end of the arm out of alignment with the trigger whereby the linkage is fully disengaged from the recess and the trigger can be pivoted in normal operative manner.

4,373,645

RESILIENT LINER FOR PARTICULATE BULK CARGO RECEPTACLES

Hugh Boyd, Tallmadge, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 30, 1981, Ser. No. 248,765
Int. Cl.³ B65G *69/08*
U.S. Cl. 222—203 **9 Claims**



1. A resilient liner for mounting within a hopper type receptacle which receives and discharges flowable bulk particulate material, said receptacle having conical or sloping walls in at least the bottom portion thereof, said liner comprising at least one panel, each panel comprising:

A. a fluid tight envelope having a top and bottom portion;

B. a valve located in the envelope in communication with the inside and outside of the envelope, through which fluid may pass in or out of the envelope when the valve is open; and

C. connecting means joined to the top and bottom portions of the envelope and extending therebetween within said envelope to retain said top and bottom portion in fixed spaced relationship to each other at various locations on both the top and bottom portion, said locations on one portion lying in a first plane and said locations on the other portion lying in a second plane substantially parallel to the first plane, said connecting means forming multiple chambers within the envelope when the inside of the envelope is at a static pressure at least slightly higher than the ambient exterior pressure;

D. said envelope and connecting means cooperatively interacting with each other in such manner that when the panel is attached to the inside of one of the walls of a receptacle and pieces of particulate material passing through the receptacle strike the top portion of the envelope, the top portion is deflected inwardly in the areas struck, thereby creating an undulating random wave motion on the top portion which aids in maintaining a constant flow of particulate material through the receptacle; and

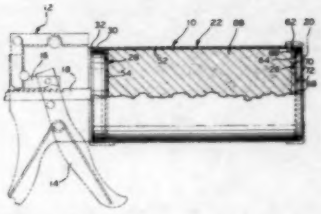
E. means attaching each panel to the inside of receptacle walls.

4,373,646

CARTRIDGE-TYPE DISPENSER

George E. MacEwen, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 63,880, Aug. 3, 1970, abandoned. This application May 14, 1981, Ser. No. 263,654
Int. Cl.³ B65D *85/72*
U.S. Cl. 222—327 **29 Claims**



1. A container comprising:

a generally cylindrically shaped tubular sidewall having an inner surface and first and second open ends, said first open end being formed in a radially inwardly rolled lip, and said second open end having an annular end face;

a generally flat circular disc disposed within said tubular sidewall in abutting relation with the radially inwardly rolled lip and having a generally cylindrical skirt on the outer periphery of said disc, said skirt terminating in a radially outwardly extending flange portion with a plurality of circumferentially spaced, radially outwardly extending bosses each extending between said flange portion and said generally cylindrical skirt, said skirt, said flange portion and said bosses being enfolded by the radially inwardly rolled lip of said generally cylindrically shaped tubular sidewall; and

plug top closure means at least partially disposed within said tubular sidewall at the second open end thereof.

22. In a cartridge-type dispenser of the type which includes a generally cylindrical tubular body having first and second end portions with dispensing outlet means in the first end portion thereof and with the second end portion thereof being open and having an annular end face thereon, the improvement comprising:

plug closure means adapted to be at least partially disposed within the second end portion of said tubular body for closing said cartridge-type dispenser, said plug closure means having a generally cylindrical closure sidewall sized and shaped to be closely received within the second end portion of said tubular body and having radially outwardly extending closure flange means on a first end portion of said closure sidewall adapted for yieldably engaging said tubular body, said closure sidewall further including at least one radially outwardly extending circumferential rib means on the outer surface thereof

adapted to tightly and slidingly engage the inner surface of said tubular body so as to at least temporarily retain said plug closure means within said second end portion of said tubular body, and means closing a second end of said generally cylindrical closure sidewall, said at least one radially outwardly extending circumferential rib means being interrupted at at least one location so as to provide means for venting gas therepast during insertion of said plug closure means in the second end portion of said tubular body.

4,373,647

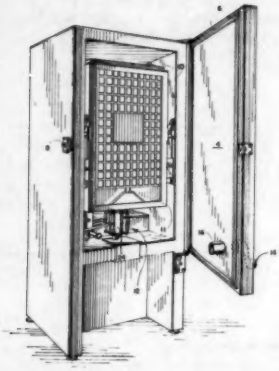
VALVE FOR USE WITH FLEXIBLE DISPENSING TUBE

Calvin R. Hollingsworth, 4744 NE. 180th, Seattle, Wash. 98155

Division of Ser. No. 157,406, Jun. 9, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,815

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—528 **6 Claims**



1. A valve mechanism for use with a flexible dispensing tube or the like comprising:

upper plate means adapted to be secured in a stationary position relative to the dispensing tube when in use, said plate including an opening to receive the dispensing tube,

a first set of substantially parallel pivotally mounted linking elements having one end secured to one face of the upper plate means,

middle plate means pivotally secured to the other end of the first set of elements, said middle plate means including an aperture to receive the tube means,

a second set of substantially parallel linking elements pivotally mounted linking elements secured to the middle plate means on the face opposite the connection with the first set of linking elements,

bottom plate means pivotally secured to the other end of the second set of linking elements, said bottom plate means including an aperture to receive the dispensing tube, and

actuating means to move the two sets of linking elements out of alignment crimping the dispensing tube and preventing fluid flow therethrough.

4,373,648

CONTROLLED RATE LINEAR MOTION DRIVE

Norbert L. Wright, Park Ridge, and Jerome A. Selusnik, Chicago, both of Ill., assignors to Teepak, Inc., Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,769

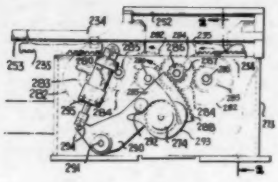
Int. Cl.³ A41H *43/00*; A22C *11/02*

U.S. Cl. 223—28 **7 Claims**

1. In a drive mechanism for converting rotational movement to linear movement, said drive mechanism being of the rack and pinion type wherein the available rack length is less than that required for its intended stroke, the improvement comprising:

a rack linearly movable from one extreme position to another extreme position; and

at least two spaced pinions disposed in substantially coplanar relationship for mating engagement with said rack, said



pinions being movable in synchronized relationship with each other;

the length of said rack and the spacing of said pinions being such that when said rack is in either of said extreme positions the same mates with only one of said pinions whereas, when said rack is in a position therebetween the same simultaneously mates with two of said pinions.

4,373,649

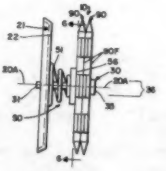
WAISTLINE SUPPORTABLE DISPENSER FOR MARTIAL ARTS "SHURIKENS" THROWING STARS

Joko Ninomiya, 4534 E. Colfax Ave., Denver, Colo. 80220

Filed Aug. 31, 1981, Ser. No. 297,727

Int. Cl.³ A41F *9/00*

U.S. Cl. 224—163 **8 Claims**



1. Waistline supportable dispenser for a plurality of uniplanar martial arts throwing stars, said throwing stars being respectively provided with an elliptical central opening, and said waistline supportable dispenser comprising:

a. a rack member having an upright frontal-side and having support means for removably attaching the rack member to the user's wearing apparel substantially at waistline level;

b. a horizontal peg rigidly attached to a central portion of the rack member and extending forwardly from its frontal-side, said peg including a trail-length relatively near said rack frontal-side and also including a cross-sectionally enlarged lead-length relatively forwardly remote from said frontal-side, said peg trail-length at its largest cross-sectional dimension being smaller than the minor-axis of the throwing star elliptical central opening, said peg lead-length being cross-sectionally ellipsoid wherein its broadest-extent is dimensionally intermediate the minor-axis and major-axis dimensions of the throwing star elliptical central opening;

c. a plurality of upright throwing stars rotatably surrounding the peg trail-length, the throwing stars being individually empirically rotated about said trail-length until their central opening minor-axes are parallel to the broadest-extent of the peg lead-length; and

d. spring means extending forwardly from the rack member frontal-side so as to forwardly bear against the trailmost throwing star whereby the stars are yieldably urged

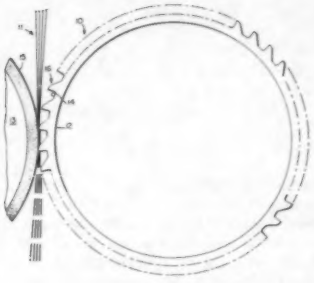
against the peg lead-length in a condition wherein they can be individually dispensed commencing at the leadmost throwing star only by counter-rotation until the central opening major-axis becomes parallel to the broadest-extent of the peg lead-length.

4,373,650

CONTINUOUS CUTTER FOR A GLASS FIBER CHOPPER

Benjamin A. Gay, Huntington Beach, Calif., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 8, 1981, Ser. No. 223,563
Int. Cl.³ D01G 1/04
U.S. Cl. 225—97 7 Claims



1. A continuous cutter ring for use in a glass fiber chopper apparatus to sever glass fiber filaments passing between said cutter ring and a cooperating elastomeric cot ring into chopped lengths of glass fibers, said cutter ring comprising:

an annular ring, said ring having an inner circumferential surface and an outer periphery; and

a plurality of chisel-shaped teeth integrally formed on said outer periphery, each of said teeth having a leading face extending radially outwardly from said outer periphery, a horizontal surface extending rearwardly in the direction of rotation of said cutter ring from an upper edge of said leading face, a transition surface extending downwardly and rearwardly from said horizontal surface, and a skirt extending downwardly and rearwardly from said transition surface to said outer periphery of said annular ring, said teeth being equally spaced on said outer periphery and extending generally across said outer periphery, so that the glass fiber filaments are sharply bent by the cooperation of said horizontal surface portion of said chisel-shaped teeth and said elastomeric cot ring to effect the severance of said glass fiber filaments by a bending and breaking action.

4,373,651

METHOD AND APPARATUS ASSEMBLING AND NAILING BOARDS TOGETHER

Charles E. Fanslow, 3371 S. Service Dr., Red Wing, Minn. 55066

Filed Sep. 2, 1980, Ser. No. 183,212
Int. Cl.³ B27F 7/02
U.S. Cl. 227—3 30 Claims

1. An automatic board nailing machine comprising,

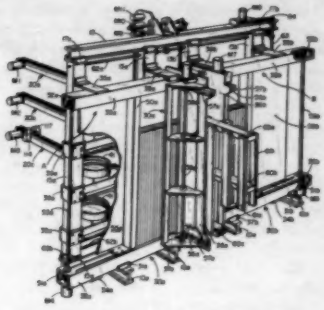
storage means for storing in stacked relation a plurality of inner boards,

automatically actuated conveyors conveying the inner boards longitudinally in a first direction along one of the longitudinal edges of the inner boards directly into nailing position from said storage means,

magazines for storing outer boards in stacked relation,

automatically actuated feeding means feeding in a second direction at right angles to the first direction outer boards in upright position on one of the ends of the outer boards from said magazines into nailing position on opposite sides of said inner boards to produce an assembly for nailing,

automatically actuated opposed nailing means on opposite



sides of said assembly for simultaneously nailing the outer boards fed into nailing position, and

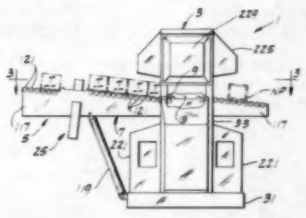
means for discharging the nailed-together assembly from the nailing position in the first direction.

4,373,652

APPARATUS FOR END-PLATING ELONGATE MEMBERS SUCH AS RAILROAD TIES

Gordon E. Matlock, Sullivan, and Owen T. Hornkohl, Webster Groves, both of Mo., assignors to Mechlenpah Industries, Inc., St. Louis, Mo.

Filed Sep. 12, 1980, Ser. No. 186,747
Int. Cl.³ B27F 7/05
U.S. Cl. 227—100 9 Claims



1. Apparatus for pressing nailing plates or the like into opposite ends of elongate members, such as wooden railroad ties, thereby to end-plate the ties, comprising:

a press;

infeed conveyor means for conveying said ties forwardly one after another in generally horizontal position and with the ties extending generally transversely of the direction of conveyance to a first station, constituting a feed station;

means engageable by each tie as it is conveyed forward on said infeed conveyor means for stopping the tie at said feed station;

walking beam feed means movable from a lowered position to a raised position in which it lifts the tie at said feed station and feeds it to a second station, constituting an end-plating station, in the press;

power means for moving the walking beam feed means between its raised and lowered positions;

said press comprising upper and lower platen means engageable with the top and bottom faces of a tie adjacent the ends of the tie, said lower platen means being movable through an upstroke for raising the tie while generally horizontal from a lowered position to an elevated position and for pressing the tie against said upper platen means

thereby to apply a vertical compressing force to the tie adjacent the ends thereof, and a downstroke for lowering the tie, side platen means engageable with opposite side faces of said tie adjacent the ends thereof when the tie is in said elevated position, said side platen means being movable toward and away from one another whereby a horizontal compressing force can be applied to and removed from opposite side faces of the tie adjacent the ends thereof, and a pair of end platents engageable with nailing plates on opposite ends of the tie for pressing the plates into the tie ends when the tie is in said elevated position and while said compressing forces are being applied to the tie by said upper, lower and side platen means;

walking beam discharge means movable between a lowered position and a raised position for discharging the tie from the press prior to the next tie being fed to said end-plating station;

power means for moving said walking beam discharge means between said raised and lowered positions; and

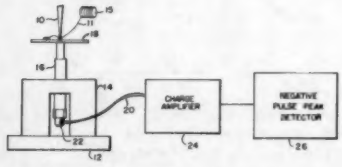
means responsive to movement of said walking beam discharge means from its lowered to its raised position for actuating said power means to move said walking beam feed means from its lowered to its raised position, said walking beam discharge means, when raised, being disposed for engagement by a tie being fed forwardly by said walking beam feed means thereby to block the tie from moving to said end-plating station prior to discharge of an end-plated tie from the press.

4,373,653

METHOD AND APPARATUS FOR ULTRASONIC BONDING

Thomas E. Salzer, Bedford, Mass., and Michael S. Masheff, St. Petersburg, Fla., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 10, 1981, Ser. No. 300,728
Int. Cl.³ B23K *21/02*
U.S. Cl. 228—104 **20 Claims**



1. A method for providing high reliability ultrasonic bonds comprising the steps of:

bonding a wire to a conductive terminal using an ultrasonic bonding tool;

generating a signal corresponding to the force required to separate said tool from said wire; and

providing a display in response to said signal for supplying the operator with data relating to the quality of the bond of said wire to said conductive terminal.

13. A system for providing high reliability ultrasonic bonds comprising:

means for bonding a wire to a conductive terminal using an ultrasonic bonding tool;

means for generating a signal corresponding to the force required to separate said tool from said wire; and

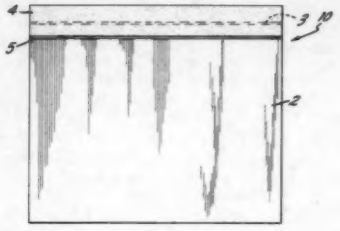
means for monitoring a plurality of successive said signals for determining trends relating to the quality of bonds of said wires to said conductive terminals.

4,373,654

METHOD OF MANUFACTURING ELECTROWINNING ANODE

Raymond D. Prengaman, Arlington, and James L. Howard, Grand Prairie, both of Tex., assignors to RSR Corporation, Dallas, Tex.

Filed Nov. 28, 1980, Ser. No. 211,435
Int. Cl.³ B23K *31/02*; B23P *17/00*; C25C *7/02*
U.S. Cl. 228—173 R **2 Claims**



1. A method of making a lead anode for electrowinning metals comprising:

(a) forming a sheet of lead alloy anode material by hot working a billet of lead alloy at temperatures above 150° C. until uniform grain size is achieved;

(b) forming a copper bus bar with a longitudinal slot of a size such that an end of the lead alloy sheet fits tightly therewith;

(c) coating the bus bar with a lead-tin alloy;

(d) fitting said end of the lead sheet into said slot of the coated bus bar; and

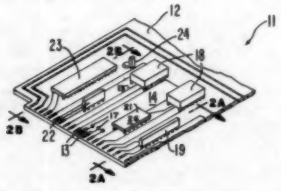
(e) soldering the bus bar and lead sheet together.

4,373,655

COMPONENT MASK FOR PRINTED CIRCUIT BOARDS AND METHOD OF USE THEREOF

Joseph A. McKenzie, Jr., 6330 Laura La., Pleasanton, Calif. 94566

Filed Jun. 26, 1980, Ser. No. 163,303
Int. Cl.³ H05K *3/34*; B23K *31/02*
U.S. Cl. 228—180 R **10 Claims**



1. A component mask for preserving unoccupied lead-holes in a printed circuit board during the application of high temperature mass connection material to mass connect electronic components to said printed circuit board while permitting high temperature mass connection material to enter said lead-holes to wet their walls and form a coating of high temperature mass connection material thereon, comprising:

(A) a supporting block; and

(B) at least one pin of plastic protruding from said block, said plastic resistant to adherence to the high temperature mass connection material and capable of withstanding the temperature of the high temperature mass connection material during mass connection of electronic components to the printed circuit board, and said pin having:

(1) a cross-sectional configuration and thickness enabling the pin to fit into a lead-hole extending through a printed circuit board and occupy said lead-hole except for a clearance surrounding the pin between the pin and wall defining the lead-hole that permits high temperature mass connection material to enter said lead-hole and wet said walls; and

(2) a length at least generally equal to the thickness of said printed circuit board whereby said pin can extend completely through said lead-hole.

4,373,656

METHOD OF PRESERVING THE SOLDERABILITY OF COPPER

John L. Parker, Jr., Sandston, and Robert B. Ranes, Richmond, both of Va., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,044
Int. Cl.³ H05K *3/22*
U.S. Cl. 228—203 **16 Claims**

1. A method of preserving the solderability of a copper surface comprising:

stabilizing the surface with an aqueous solution comprising a mixture of an acid phosphate and a glycol;

treating the stabilized surface with a protective azole; and

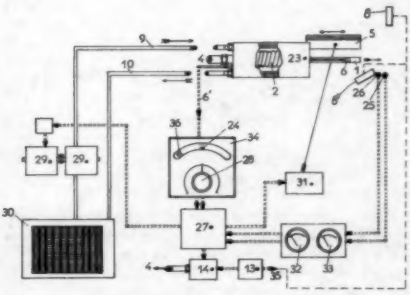
rinsing the azole treated surface so as to remove excess azole.

4,373,657

DEVICES AND METHOD FOR DELIVERY OF SOLDER AND BRAZING MATERIAL

Marc Fillon, 120 Grande Rue, 89720 Villeblevin, France

Filed Jun. 27, 1980, Ser. No. 163,429
Int. Cl.³ B23K *9/12, 3/06*
U.S. Cl. 228—229 **16 Claims**



1. A device for feeding filler metal for a welding operation of the type having a burner and a means for feeding gases, comprising:

a guide body for delivering the filler metal, said guide body being exposed to the heat from the burner to preheat the filler metal in the guide body to a temperature just below its melting point, the feed of the filler metal being in response to the temperature of the filler metal in the guide body, and the operation of the burner and the feed of gases being responsive to the feed of filler metal, whereby when the feed of the filler metal stops to change the workpiece, the ignition of the burner and the feed of the gases also stops.

10. A method for feeding filler metal for a welding operation, comprising the steps of:

delivering the filler metal through a guide body, preheating the filler metal located at the end portion of the guide body to a temperature just below its melting point by exposing the said end portion of the guide body to heat from a heat supplying burner,

sensing the temperature of the filler metal at said end portion,

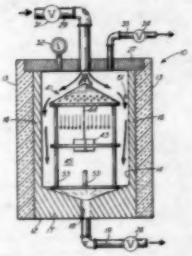
and setting the speed of feed of the filler metal in response to the sensed temperature.

4,373,658

HIGH PRESSURE CONDENSATION SOLDERING, FUSING OR BRAZING

Edward J. March, Lower Makefield Township, Bucks County, Pa., and Raymond J. Newman, Lawrence Township, Mercer County, N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,204
Int. Cl.³ B23K *3/00*; F27D *7/02*
U.S. Cl. 228—242 **7 Claims**



1. A method of forming a vapor processing zone, having a substantially uniform temperature distribution therein, within a high pressure steam condensation heating chamber for soldering, fusing or brazing an article therein, the method comprising the steps of:

forming a shield of steam between the chamber wall and the vapor processing zone; and

simultaneously directing high pressure steam into said processing zone at a temperature sufficient to solder, fuse or braze said article.

4,373,659

STACKABLE CARTON WITH LID

William F. Cornell, Fresno; John P. Vear, Salinas, both of Calif., and E. Anthony Pascuzzi, Arden Hills, Minn., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 89,885, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 936,612, Aug. 24, 1978, Pat. No. 4,175,691. This application Mar. 3, 1981, Ser. No. 239,897
Int. Cl.³ B65D *5/26, 13/00*
U.S. Cl. 229—32 **10 Claims**

1. A closed stackable carton having a tray portion and a lid portion comprising in combination:

a tray made from a blank having a rectangular floor panel;

first and second generally rectangular tray side wall panels extending from fold lines defining a pair of opposite sides of said floor panel;

first and second pairs of tray side wall flaps extending from fold lines which define the ends of the side wall panels;

each tray side wall flap including a projection at the extreme free end defining at least a half of a tab for extending upwardly from an upper edge of said flap and a corresponding recess at the extreme free end of the lower edge of said flap in vertical alignment with said projection;

first and second generally rectangular tray end wall panels extending from fold lines defining a pair of opposite ends of said floor panel;

each of said tray end wall panels having at least one recess at

its lower edge to correspond with a recess defined in the lower edge of said tray side wall flaps in vertical alignment with said projections in the upper edges of said flaps when said tray blank is folded to form the tray of the stackable carton;

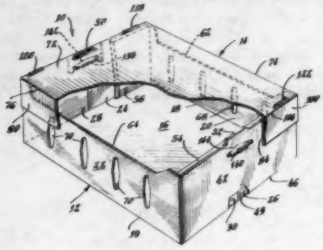
a lid made from a blank having a rectangular top panel slightly larger than the floor panel of said tray;

first and second generally rectangular lid side wall panels extending from fold lines defining a pair of opposite sides of said top panel;

first and second pairs of lid side wall flaps extending outwardly from fold lines defining the ends of the lid side wall panels;

first and second lid end panels extending from fold lines defining a pair of opposite ends of said top panel;

said lid top panel having openings formed therein adjacent the lid top panel ends in alignment with said tray tabs on said end wall panels and defined by the projections on the upper edges of said side panel flaps for receiving said tray tabs when said tray blank is folded to form the tray of the stackable carton and the lid blank is folded to form the lid therefor and assembled with the tray to complete the closed restackable carton.



4,373,660

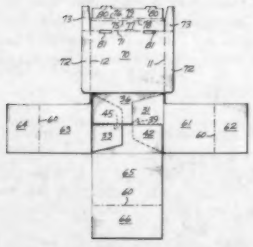
CONTAINER

Richard Wytko, Olympia, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 284,426, Jul. 20, 1981, abandoned. This application Mar. 17, 1982, Ser. No. 358,981

Int. Cl.³ B65D *5/10, 5/22, 5/66*

U.S. Cl. 279—39 R **7 Claims**



5. A container comprising a first, second, third and fourth panels serially connected by score lines,

means for connecting said first and fourth panels,

two of said first, second, third and fourth panels being opposed side walls of the container,

the other two of said first, second, third and fourth panels being opposed front and back walls of the container,

a bottom closure extending along the lower edge of said first, second, third and fourth panels,

said bottom closure including opposed truncated panels extending from said opposed side walls and opposed rectangular panels extending from said front and back walls respectfully, each said rectangular panel extending beyond the major axis of the container bottom and includes a converging recess at the midpoint of its outer free edge and a diagonal score line extending inwardly from said recess thereby forming a fold back section, said fold back sections adhesively secured to the adjacent truncated panel, said bottom panel being secured with the engagement of said recesses,

a front reinforcing panel hingedly attached to the upper edge of said front panel extending into said container in contact with the inner face of said front panel,

side reinforcing panels hinged to the upper edges of said side panels and extending downwardly into the container in contact with the inner face of said side panels, and

a cover panel extending from the upper edge of said back panel, front and side panels extending downwardly from said cover panel, said front and side cover panels being attached, bottom reinforcing panels hinged to the lower edges of said front and side reinforcing panels, each said bottom reinforcing panel being rectangularly shaped and of equal length and extending normal to respective front and side reinforcing panels a distance such that opposed bottom reinforcing panels overlap each other.

4,373,661

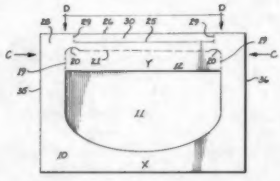
CARTON WITH INSPECTION FLAP AND EASY OPENING FEATURES AND BLANKS THEREFOR

Burton R. Lundquist, Pinnacle Peak, and Thomas A. Kozlowski, Phoenix, both of Ariz., assignors to Armour and Company, Phoenix, Ariz.

Filed May 17, 1978, Ser. No. 906,542

Int. Cl.³ B65D *5/42*

U.S. Cl. 229—87 F **4 Claims**



1. In a carton blank for constructing a carton for displaying a product such as bacon, wherein the blank is comprised of:

a. a top panel having a cut-out viewing area,

b. a bottom panel and side walls,

c. a glue flap,

d. an edge section of the top panel being located between the cut-out viewing area and the one edge of the top panel adjacent to the cut-out viewing area and having substantially the same width as the glue flap,

e. an inspection flap covering at least a portion of the cut-out viewing area and hingedly connected to the edge section of the top panel along a hinge line and having sides connected to the top panel by lines of weakness,

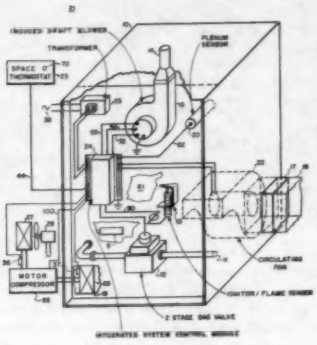
f. at least one scoring line adjacent a ply-separation area designed to provide easy opening of the carton,

the invention comprising an arrangement wherein a single scoring line is located in the edge section adjacent to the inspection flap and defines the edge of a ply-separation area along which the glue flap attaches, said scoring line being no longer in length than the distance across the inspection flap between said lines of weakness and lying within an area bounded by the ends of said inspection flap, so that the lines of force initially created by lifting said inspection flap in an upward manner do not intersect said ply-separation area located in said edge section,

4,373,662
INTEGRATED CONTROL SYSTEM USING A MICROPROCESSOR

William W. Bassett, Wayzata, and Dean R. Rask, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 17, 1980, Ser. No. 197,841
Int. Cl.[3] F24D 5/10; G05D 23/00
U.S. Cl. 236—10 1 Claim



1. In a temperature control system for a temperature changing apparatus delivering temperature conditioned air from a plenum by an air blower to a space comprising

space temperature responsive means adapted to respond to the temperature in the space,

control means adapted to control the temperature conditioning apparatus,

means connecting said space temperature responsive means to said control means to maintain a predetermined temperature in the space,

operating output temperature responsive means adapted to respond to the output temperature of the conditioned air,

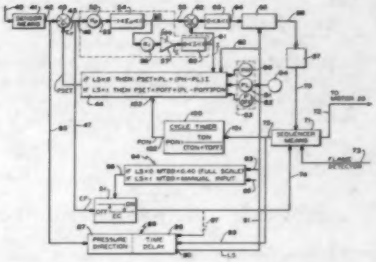
means connecting said operating output temperature responsive means to said control means for detecting an abnormal operation of the temperature conditioning apparatus upon an abnormal increase in the output temperature, wherein said output responsive means upon a first increase to a first predetermined output in operating output, provides a visual indication of said first output, upon a second increase to a second predetermined output in operating output, provides a signal to said control means to reduce the operation of the temperature conditioning apparatus, and upon a third increase to a third predetermined output in operating output, provides a turning off operation.

4,373,663
CONDITION CONTROL SYSTEM FOR EFFICIENT TRANSFER OF ENERGY TO AND FROM A WORKING FLUID

Jeffrey M. Hammer, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 10, 1981, Ser. No. 329,147
Int. Cl.[3] F23N 1/00; G06F 15/20
U.S. Cl. 236—15 R 20 Claims

1. A condition control system adapted to control a system for modifying a working fluid by controlling the transfer of energy to and from said working fluid at varying rates including a fixed lower on rate, a fixed upper rate, and a modulating rate between said two fixed rates, including: condition sensor means including output means responsive to the condition of said working fluid; setpoint means having at least two operating modes and including adjustable input means to set a level of operation for said system; said setpoint means including system responsive input means, and having output means which is dependent upon said adjustable input means and said system responsive input means to determine which of said operating modes is provided to control said setpoint output means; said setpoint output means being combined with said condition sensor output means to provide a preliminary error signal; off-on error detection means connected to receive said preliminary error signal and having output means providing an off-on output control signal; condition control sequencer means connected to control said system between an off state and said fixed upper rate to modify said working fluid with said on-off error detection output means controlling said sequencer means between said off state and said lower on rate; error signal processing means connected to said preliminary error signal and having error signal output means and further having integrated output signal means; combining means connected to said error signal output means and to said integrated output signal means to provide a sequencer command output signal capable of operating said sequencer means from said lower on



state to said fixed upper rate; said integrated output signal means further connected to said setpoint means to affect a first of said operating modes of said setpoint means; responsive means having input means connected to said condition sensor output means and having further input means responsive to said on-off error detector means; said load responsive means having switched output means that acts as a limit for said system; said switched output means connected to said setpoint system responsive input means to select one of said operating modes; gate means controlled by said switched output means to in turn control the connection of said sequencer command output signal means to said sequencer means; and cycle timer means having an input responsive to said sequencer means wherein said off-on error detection means provides the operating time of said system, and an output connected to said setpoint means to determine an operating level of said setpoint means to affect a second of said modes of said setpoint means operation.

4,373,664
WALL THERMOSTAT AND THE LIKE

Charles E. Barker; Anthony C. Cairo; Frederick T. Bauer, all of Holland, Mich., and Auzville Jackson, Jr., Richmond, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 116,959, Jan. 30, 1980, Pat. No. 4,319,711, which is a continuation of Ser. No. 840,582, Oct. 11, 1977, abandoned. This application May 14, 1981, Ser. No. 263,730
Int. Cl.[3] F23N 5/20; G08B 23/00
U.S. Cl. 236—46 R 9 Claims

1. An ambient air unitary self contained wall thermostat comprising:

ambient air temperature sensing providing analog signals indicative of actual temperature in an enclosed zone;

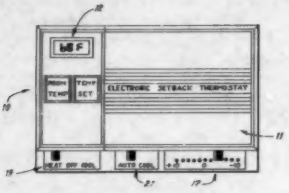
analog to digital conversion means for converting said signals indicative of actual temperature to binary encoded form;

means for storing a desired temperature in binary encoded form;

means for manually entering said desired temperature into said means for storing;

means for comparing said binary encoded signals indicative of actual desired temperatures and for providing an actuating signal to a heating or cooling source to conform said actual temperature to said desired temperature;

means for selectively suppressing response to prevent mis-



leading transitory excursions of sensed temperature from average actual zone temperature; and

means responsive to the provisions of said actuating signal for determining the predicted time of coincidence of said actual temperature with said desired temperature in response to operation of said heating or cooling source and for responsively terminating generation of said actuating signal.

4,373,665

DEFORMABLE LIGHT-WEIGHT HOUSING STRUCTURE

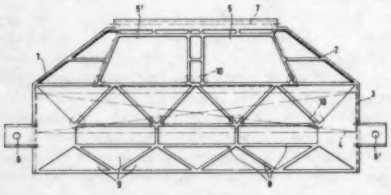
Kurt Dietzsch, Leonberg-Eltingen, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,498

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856031

Int. Cl.³ B62D *25/00*; B60H *1/02*

U.S. Cl. 237—12.3 A **7 Claims**



1. A light-weight deformable air-conducting housing for use as a collapsing component in a vehicle, comprising:

a load-bearing latice structure comprising a plurality of elongated members of a first thickness interconnected together in a rigid truss-like configuration having a predetermined axis of collapse and a plurality of open spaces between said elongated members;

a non-load-bearing skin of a second thickness which is smaller than said first thickness of said elongated members, said skin closing in an airtight manner the open spaces between said elongated members and defining therein at least one air inlet and at least one air outlet;

means on said housing for attaching said lattice structure to the body of a vehicle so that said predetermined axis of collapse of said housing coincides substantially with the longitudinal axis of the vehicle; and

wherein said housing comprises a heater housing attached beneath the dashboard of a vehicle and contains a heater positioned therein.

4,373,666

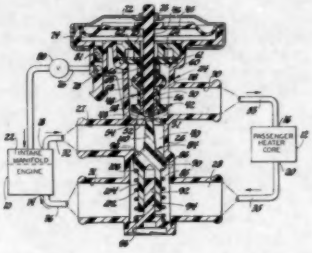
ENGINE COOLING-PASSENGER HEATING SYSTEM

Donald L. Williams, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1981, Ser. No. 277,869

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 B **3 Claims**



1. An engine cooling-passenger heating system comprising an engine and a passenger heater each having an inlet and outlet for a cooling-heating liquid wherein the engine outlet to the heater is at a liquid jacketed intake manifold on the engine, and multi-mode valve means for connecting said engine outlet to said engine inlet to thereby bypass all liquid flow past said passenger heater for a no-heat mode while maintaining flow circulation through the jacketed intake manifold and alternatively connecting said engine outlet to said heater inlet and said heater outlet to said engine inlet to thereby effect flow through said heater for a heat mode while also being responsive to pressure drop across said heater above a predetermined value to also simultaneously establish in said heat mode a restricted connection between said engine outlet and said engine inlet to thereby effect limited bypass flow past and limited flow through said heater to maintain circulation through the jacketed intake manifold while minimizing the strength requirements of the heater.

4,373,667

DEVICES FOR ELASTICALLY FASTENING RAIL-WAY RAILS BY LOCKING

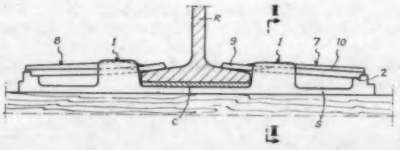
Michel Duchemin, Lambres Lez Douai, France, assignor to Ressorts Industrie, Paris, France

Filed Sep. 29, 1980, Ser. No. 191,765

Claims priority, application France, Oct. 2, 1979, 79 24530

Int. Cl.³ E01B *9/30*

U.S. Cl. 238—349 **4 Claims**



1. A device for elastically fastening a rail having a flange portion to a support, comprising:

tie plate means secured to said support and including two lobe means defining a support area on which said flange portion is adapted to be supported, each lobe means including a groove, and at least one end support positioned remotely with respect to said rail; and

two clip means, each engageable between said flange portion and said at least one end support, each including a resilient portion engageable with said flange portion and a rigid

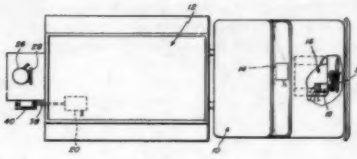
portion, the latter rigid portion including two side portions slidably receivable within a respective one of said grooves, a rigidifying middle portion, a first end engageable with said at least one end support and a second opposite end positioned at least immediately adjacent said flange portion.

4,373,668

SPREADER CONTROL

Donald R. Forbes, Rte. 107, Raymond Rd., Deerfield, N.H. 03037, and Edson A. Forbes, 12 D'Angelo Rd., Wayland, Mass. 01778

Filed Jun. 6, 1980, Ser. No. 156,925
Int. Cl.³ A01C *17/00*
U.S. Cl. 239—74 **10 Claims**



1. Spreader control system for a vehicle having an internal combustion engine and a conveyor means for a product that is to be spread leading to a spreader, said system comprising;

electrical spreader motor,

means for mounting the spreader motor at a rear of the vehicle adjacent the conveyor means for operating the vehicle spreader,

electrical conveyor motor,

means for mounting the conveyor motor for driving the conveyor motor,

first control means including means for controlling the electrical spreader motor comprising manually settable adjustment means for controlling spreader motor speed independent of conveyor motor speed,

and second control means for controlling the electrical conveyor motor, including alternator power means operated from the vehicle internal combustion engine and means for controlling the alternator power means output to the electrical conveyor motor,

wherein said second control means includes a computer, mode control means having a manual position and an automatic position, means coupling the mode control means to the computer, said computer having a control output line, means coupling the computer output line to a control winding of the alternator power means, said mode control means in its manual position providing a preset frequency signal for controlling the conveyor motor at a set revolution per time, means for sensing vehicle speed, said mode control means in its automatic position providing a control signal to the conveyor motor to operate the conveyor motor as a speed which is a function of both a preset signal and the vehicle speed signal.

4,373,669

HYDRAULIC DRIVE FOR AN AGRICULTURAL SPRAYER

William C. Swanson, Clarendon Hills, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Nov. 28, 1980, Ser. No. 210,984
Int. Cl.³ B05B *9/04*
U.S. Cl. 239—124 **4 Claims**

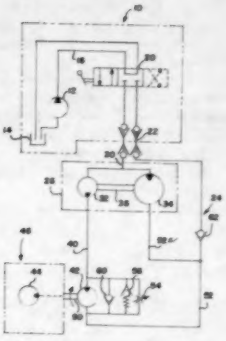
1. In an agricultural vehicle with a hydraulic system adapted for use as a liquid dispensing sprayer, a sprayer hydraulic drive comprising:

an independent hydraulic source circuit including at least a pump and a reservoir;

valve means interconnecting said circuit with a sprayer pump circuit facilitating activation and deactivation of said sprayer pump circuit for various modes of operation;

a rotary flow divider operatively connected with said valve means and including a motor rotor linked with a pump rotor via a shaft;

said pump rotor hydraulically connected with and driving a sprayer motor;



said sprayer motor driving a centrifugal pump of said liquid dispensing sprayer; and

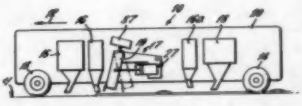
pressure relief means for bypassing said sprayer motor and merging with a sprayer pump circuit return line linked with said motor rotor.

4,373,670

APPARATUS FOR APPLYING ROAD MARKING MATERIALS TO ROADWAYS

David N. Kilner, Horsham, England, assignor to Prismo Universal Limited, Surrey, England

Filed Jul. 30, 1981, Ser. No. 288,334
Claims priority, application United Kingdom, Jul. 30, 1980, 8024894
Int. Cl.³ B05B *1/20*; A01G *25/09*; E01C *19/16*; E01H *3/02*
U.S. Cl. 239—172 **6 Claims**



1. Apparatus for applying road marking material to a trafficable surface of a roadway comprising a vehicle, ejector means mounted on the vehicle and operable to deliver discrete blobs of a fluid road marking material directly onto a said surface from a delivery port of the ejector means, and a ram connected between the ejector means and a part of the vehicle for moving the ejector means relative to the vehicle during ejection so that, in use, when the vehicle is propelled along a roadway the speed of the delivery port relative to the roadway during delivery of the blobs is reduced.

4,373,671

ELECTROMAGNETIC FUEL INJECTOR

Dante S. Giardini, Dearborn Hgts., Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 13, 1981, Ser. No. 253,458
Int. Cl.³ B05B *1/30*
U.S. Cl. 239—585 **19 Claims**

1. A fuel injector for use in a combustion chamber of an internal combustion engine; said injector characterized by:

a housing having a cavity therein with a fuel outlet orifice and a fuel inlet port being in communication with said cavity;

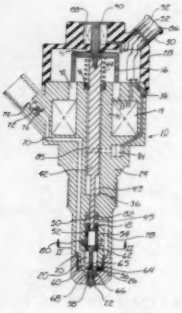
a fuel flow control valve moveable to block or permit fuel flow through the orifice;

a fuel flow control valve spring means for moving said valve to a closed position;

a fuel displacement means in said cavity and dividing said cavity into first and second sections, said first section being in pressure communication with said combustion chamber and said second section in communication with said fuel flow control valve;

a one-way check valve mounted at said inlet port, said check valve being able to open to permit an inflow of fuel into said second section of said cavity and being able to close to permit a buildup of pressure in said other section of said cavity when the control valve is in its closed position;

an electromagnetic assembly mounted within said housing having a coil and armature;



said housing defining first and second substantially parallel pole surfaces defining a gap adjacent said coil;

a magnetic field passing transversely through said gap when said coil is energized;

said armature received in said gap;

said armature being connected to said fluid driving means;

an armature spring means urging said armature to a first position;

said armature being moveable to a second position when said coil is energized to operably move said fuel displacement means to displace the fuel which opens said fuel flow control valve;

combustion chamber pressure in said first section applying a force on said displacement means to displace said fuel within said second section; said force counteracting in part any force exerted by the combustion chamber pressures on said valve and on fuel within said second section when said valve is open that works against displacing of fuel by said displacement means.

4,373,672

ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Teru Morishita, Shizuoka; Yoshimichi Ishioka, Susono, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 29, 1981, Ser. No. 230,112

Claims priority, application Japan, Aug. 6, 1980, 55-107075

Int. Cl.³ B05B *5/04*; F16C *32/06*

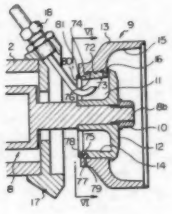
U.S. Cl. 239—703 **18 Claims**

1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

a metallic rotary shaft rotatably arranged in said housing and having an axis of rotation, a front end, and a rear end;

a cup-shaped metallic spray head fixed onto said front end of said rotary shaft and comprising a spray head supporting member which has a cylindrical outer circumferential wall, and a spray head body which has a cup-shaped inner wall and a cylindrical inner circumferential wall fitted onto said cylindrical outer circumferential wall of said spray head supporting member, said cylindrical inner circumferential wall of said spray head body having a radially inwardly projecting annular projection which is arranged at a location which is rearwardly distal with respect to said cup-shaped inner wall and has a rear end face directed to said rear end of said metallic housing, said cylindrical outer circumferential wall of said spray head supporting member having a thin extending portion which extends towards said rear end of said metallic housing and defines at least a portion of an annular groove fitted onto said annular projection, said thin extending portion having a rear end which is radially outwardly bent onto said rear end face of said annular projection for securing said spray head body to said spray head supporting member;



feeding means for feeding a paint onto said cup-shaped inner wall;

drive means cooperating with said metallic rotary shaft for rotating said metallic rotary shaft;

non-contact type radial bearing means arranged in said metallic housing and cooperating with said metallic rotary shaft for radially supporting said metallic rotary shaft under a non-contacting state;

non-contact type thrust bearing means arranged in said metallic housing and cooperating with said metallic rotary shaft for axially supporting said metallic rotary shaft under a non-contacting state;

terminal means for receiving a negative high voltage, said terminal means being connected to said metallic housing, and;

electrode means arranged in said metallic housing and electrically connecting said terminal means and said cup-shaped metallic spray head.

4,373,673

ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Teru Morishita, Shizuoka; Matuyosi Sugiyama; Akira Sato, both of Susono, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 9, 1980, Ser. No. 167,331

Claims priority, application Japan, Feb. 19, 1980, 55-18451

Int. Cl.³ B05B *5/04*; F16C *32/04, 32/06*

U.S. Cl. 239—703 **15 Claims**

1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

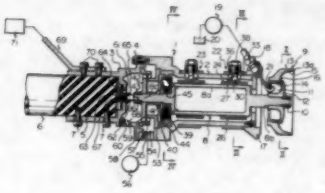
a metallic rotary shaft rotatably arranged in said metallic housing and having a front end and a rear end, said rotary shaft further having a hollow shaft portion having a first diameter, said hollow shaft portion being axially contiguous with a solid shaft portion having a second diameter, said first diameter being larger than said second diameter;

a cup shaped metallic spray head fixed onto the front end of said rotary shaft and having a cup shaped inner wall;

feeding means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

non-contact type radial bearing means arranged in said metallic housing and arranged with respect to said metallic rotary shaft so as to be adjacent to said hollow shaft portion of said rotary shaft for radially supporting said rotary shaft under a non-contacting state;



non-contact type thrust magnetic bearing means arranged in said metallic housing and arranged with respect to said metallic rotary shaft so as to be adjacent to said solid shaft portion for axially supporting said metallic rotary shaft under a non-contacting state;

terminal means for receiving a negative high voltage, said terminal means being connected to said housing; and

electrode means arranged in said housing and electrically connecting said terminal means to said spray head.

4,373,674

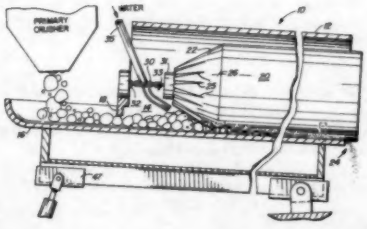
CRUSHING METHOD AND APPARATUS

Marion Barrera, P.O. Box 185, Fort Thomas, Ariz. 85536, and Raymond Godfrey, 617 3rd St., Safford, Ariz. 85546

Continuation-in-part of Ser. No. 12,022, Feb. 14, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 178,957

Int. Cl.³ B02C *19/08, 1/00*

U.S. Cl. 241—15 **12 Claims**



1. An apparatus for crushing and/or pulverizing materials comprising:

(a) a generally cylindrical elongate mortar member defining an interior crushing chamber having an inlet and a discharge;

(b) an elongate pestle within said chamber secured therein independent of said mortar, said pestle being provided with a head end adjacent the said inlet which diverges generally outwardly from the inlet end towards the discharge end, said head end further being provided with grooves therein; and

(c) means for imparting a rocking motion to said mortar.

4,373,675

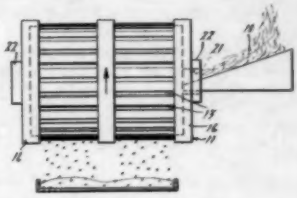
METHOD FOR BENEFICIATING DUCTILE SCRAP METAL

Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1980, Ser. No. 207,176

Int. Cl.³ B02C *17/00*

U.S. Cl. 241—23 **14 Claims**



1. A method of hammering ductile tangled ribbons of machining scrap into a densified intermediate product, comprising:

(a) subjecting a collection of said ductile tangled ribbons of machining scrap having a packing density of less than 50 lbs. per cubic foot to impacting forces between weighted, freely moving elements and an anvil means, said impacting forces being applied to progressively flatten said scrap;

(b) repeating said impacting until said machining scrap is comprised of a collection of substantially flattened fragmented ribbons having a packing density in excess of 90 lbs. per cubic foot.

4,373,676

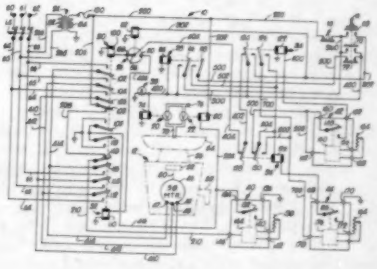
WASTE FOOD DISPOSAL SYSTEM

George O. Sherman, Jr., Prairie Village, Kans., assignor to Salvajor Company, Kansas City, Mo.

Filed Nov. 24, 1980, Ser. No. 209,883

Int. Cl.³ B02C *25/00, 23/36*

U.S. Cl. 241—36 **9 Claims**



1. In a disposal system for waste food materials or the like having:

disposer means, including inlet means adapted for receiving waste materials and water, shiftable comminuting means adapted when shifted for comminuting said materials in the presence of said water, electric motor means operably coupled with said comminuting means and adapted when electrically energized for operating to shift said comminuting means, and outlet means adapted for discharging said water and said materials comminuted by said comminuting means to a sewer or the like;

water supply means for supplying water to said disposer means for lubricating, flushing and cooling the latter, including first valve means having open and closed states,

adapted when in said open state thereof for permitting flow of water at a first predetermined rate from a source thereof to said inlet means and adapted when in said closed state thereof for blocking said flow of water at said first rate, and first electrically responsive valve operating means operably coupled with said first valve means, having first and second states of actuation dependent upon the condition of absence or presence of electrical energization applied thereto, adapted when in said first state of actuation thereof for placing said first valve means in said closed state of the latter and adapted when in said second state thereof for placing said first valve means in said open state of the latter; and

power controlling means for influencing the energization states of said disposer means and said water supply means, including motor switching means having open and closed states, adapted for being electrically coupled in series between said motor means and a source of electrical energizing power for the latter, adapted when in said open state thereof for deenergizing said motor means and adapted when in said closed state thereof for electrically coupling said motor means with said source of electrical energizing power therefor, valve switching means having open and closed states, adapted for being electrically coupled in series between said first valve operating means and a source of electrical energizing power for the latter, adapted when in said open state thereof for placing said first valve operating means in said first state of actuation of the latter to close said first valve means and adapted when in said closed state thereof for placing said first valve operating means in said second state of actuation thereof to open said first valve means, and first electrically responsive motor and valve control means operably coupled with said motor switching means and said valve switching means, having first and second states of actuation dependent upon the condition of absence or presence of electrical energization applied thereto, adapted when in said first state of actuation thereof for placing said motor switching means and said valve switching means in said open states of the latter to deactivate said motor means and close said first valve means and adapted when in said second state of actuation thereof for placing said motor switching means and said valve switching means in said closed states of the latter to operate said motor means and open said first valve means;

improved means for the coordinated control of said disposer means, said water supply means and said power controlling means, including:

first timed switching means, including first switched path means having open and closed states, and first electrically responsive timing and controlling means operably coupled with said first switching path means, provided with first control terminal means and adapted when an electrical triggering signal is applied to said first control terminal means while said first switched path means is in said closed state thereof comprising its normal standby state for placing said first switched path means in said open state thereof for a predetermined period of time and then restoring said first switched path to said closed state thereof at the end of said period of time;

second timed switching means, including second switched path means having open and closed states, and second electrically responsive timing and contolling means operably coupled with said second switching path means, provided with second control terminal means and adapted when an electrical triggering signal is applied to said second control terminal means while said second switched path means is in said open state thereof comprising its normal standby state for placing said second switched path means in said closed state thereof for a predetermined interval of time and then restoring said second switched path means to said open state thereof at the end of said interval of time;

first electric control means, including first and second control switch means each having open and closed states, and first electrically responsive actuator means operably coupled with said first and second control switch means, having first and second states of actuation thereof dependent upon the condition of absence or presence of electrical energization applied thereto, adapted when in said first state of actuation thereof comprising its normal standby state for placing said first control switch means in said open state of the latter and said second control switch means in said closed state of the latter and adapted when in said second state of actuation thereof for placing said first control switch means in said closed state of the latter and said second control switch means in said open state of the latter;

second electric control means, including third and fourth control switch means each having open and closed states, and second electrically responsive actuator means operably coupled with said third and fourth control switch means, having first and second states of actuation dependent upon the condition of absence or presence of electrical energization applied thereto, adapted when in said first state of actuation thereof comprising its normal standby state for placing said third control switch means in said closed state of the latter and said fourth control switch means in said closed state of the latter and adapted when in said second state of actuation thereof for placing said third control switch means in said open state of the latter and said fourth control switch means in said open state of the latter;

first electrical circuit means having said third control switch means in series therewith adapted for electrically coupling said first control terminal means with a source of electrical control power;

second electrical circuit means having said first control switch means in series therewith adapted for electrically coupling said second control terminal means with a source of electrical control power;

third electrical circuit means having said third control switch means and said first switched path means in series therewith adapted for electrically coupling said first actuator means with a source of electrical control power;

fourth electrical circuit means having said second switched path means in series therewith adapted for electrically coupling said second actuator means with a source of electrical control power; and

fifth electrical circuit means having said second and fourth control switch means in series therewith adapted for electrically coupling said first motor and valve control means with a source of electrical control power.

4,373,677

SAFETY DEVICE FOR ELECTRIC MOTOR DRIVEN KITCHEN UTENSILS

Yukitoshi Kunihiro, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1980, Ser. No. 203,148

Claims priority, application Japan, Nov. 24, 1979, 54-152319

Int. Cl.³ B02C *18/12*

U.S. Cl. 241—37.5 **9 Claims**

1. A safety device for kitchen utensils comprising

a body containing an electric motor,

a container mounted on said body,

a cutter provided in said container and driven by said electric motor,

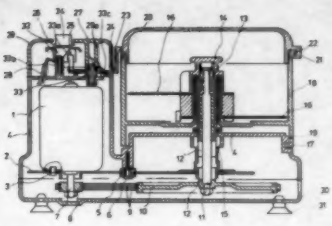
a container lid to cover said container, and

a switch device to control electrification of said electric motor by operation of its buttons,

said lid of said container having on its periphery an interlocking member,

said body having a cradle means which is journaled thereon, is to be driven by said interlocking member and controls motion of a slider of said switch device, which slider

prohibits closing of said switch device at its first position thereof and allows closing of said switch at its second position which is defined by an engagement of said interlocking member with said cradle means at placing of said



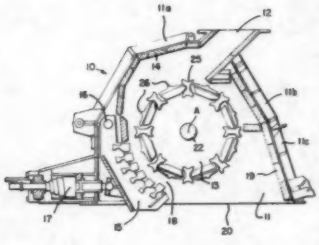
container lid to correctly cover said container, said container lid being removable irrespective of positions of said switch device, closing of said switch device being released upon removal of said container lid.

4,373,678

ROTARY IMPACT CRUSHER HAVING A CONTINUOUS ROTARY CIRCUMFERENCE

Guenther W. Reitter, 2811 Merlin Rd., Camp Hill, Pa. 17011

Filed Jun. 30, 1980, Ser. No. 163,956
Int. Cl.³ B02C *13/28*
U.S. Cl. 241—189 R **6 Claims**



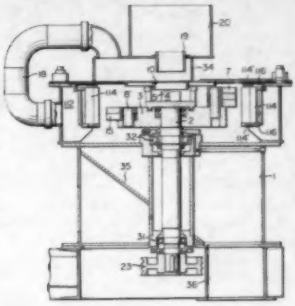
1. A rotary impact crusher impeller having a drive shaft, two spaced shaft plates mounted on the shaft and extending radially outwardly of the shaft, impeller blade recess in the periphery of each shaft plate, a plurality of impeller blades spaced around the periphery of each shaft plate with each blade extending through an impeller blade recess in each shaft plate and the longitudinal axis of the blade generally parallel to the axis of the rotary shaft, wherein the improvement comprises a plurality of peripheral plates each having a radial inner surface, each peripheral plate overlying the opening between two adjacent impeller blades and the spaced shaft plates, the radial inner surfaces of the peripheral plates resting upon the outer peripheral surfaces of the shaft plates between the adjacent impeller blades, a mounting member on the radial inner surface of each peripheral plate and removable mounting means engageable with the mounting members for securing the peripheral plates to the impeller against centrifugal forces wherein the impeller blades and peripheral plates form an essentially continuous surface extending around the impeller for preventing work from falling into the impeller interior during low-speed crushing.

4,373,679

IMPACT TYPE CRUSHER

Yoshihiko Kawano, Honami; Hiroshi Adachi, Iizuka; Masakazu Watanuki, Iizuka, and Takashi Ueno, Iizuka, all of Japan, assignors to Kobukuro Iron Works Co., Ltd., Fukuoka, Japan

Filed Jul. 22, 1980, Ser. No. 171,822
Claims priority, application Japan, Jul. 23, 1979, 54-94671; Jul. 25, 1979, 54-95267; Jul. 26, 1979, 54-104570[U]
Int. Cl.³ B02C *13/09*
U.S. Cl. 241—275 **15 Claims**



1. A crusher comprising a frame having a substantially closed hollow cylindrical form with a raw material supply orifice being formed in its upper wall, a vertical rotary shaft rotatively supported within said frame below said raw material supply orifice, a horizontal motor mounted within said frame at the upper end of said rotary shaft for rotation in a rotational direction, a hollow rotary cylinder having a peripheral wall mounted within said frame to the upper surface of said rotor centrally thereof, said hollow rotary cylinder having an outer peripheral surface spaced from the inner cylindrical surface of said frame, being opened at its upper end below said raw material supply orifice and having a bottom closing its bottom end, said peripheral wall of said hollow rotary cylinder having at least one slot for ejecting therethrough by centrifugal force into an ejection space raw material fed onto said bottom, and at least one main striking member mounted to said rotor outside said hollow rotary cylinder, spaced from said outer peripheral wall of said hollow rotary cylinder to define therebetween the cylindrical raw material ejection space, the radial width of said ejection space being much greater than the thickness of said peripheral wall and having a striking surface facing towards said rotational direction of said rotor such that said raw material ejected through said slot impinges upon said striking surface during its movement through said raw material ejection space.

4,373,680

COILING PROCESS AND APPARATUS BY RADIALLY WINDING A FILAMENT

Jacques Polge, Bures Sur Yvett, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 9, 1980, Ser. No. 214,680
Claims priority, application France, Dec. 26, 1979, 79 31680
Int. Cl.³ B65H *81/04*
U.S. Cl. 242—7.02 **5 Claims**

1. An apparatus for coiling a filament on a sector shaped mandrel, said apparatus comprising:

a fixed frame;

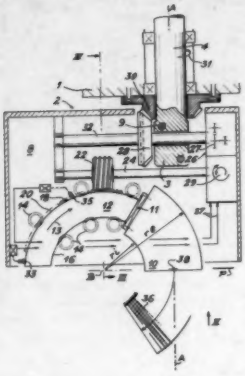
a shaft having a first fixed longitudinal axis and rotatably held by said frame;

means for rotating said shaft about said first axis at a first rotational speed;

a chassis supported by said shaft for rotation about said first axis;

a circular arc-shaped supporting arm guided by said chassis for rotation about a second axis orthogonal to said first axis;

drive means for rotating said supporting arm about said second axis at a rotational speed less than said first rotational speed, said drive means including a driven worm screw meshing with a toothed sector of said supporting arm;



means for supporting said mandrel on one end of said supporting arm; and

means for supplying said filament to said mandrel in a coiling plane,

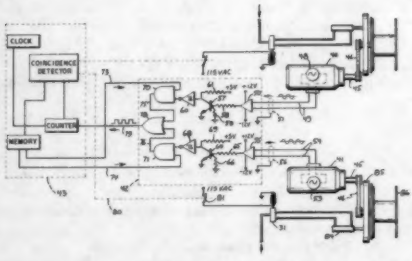
whereby said mandrel rotates about said first and second axes.

4,373,681

METHOD AND APPARATUS FOR CONTROLLING A STRAND TAKEUP REEL SHROUD

Edgar W. Crews, Mesa, and Charles E. Sprain, Phoenix, both of Ariz., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,809
Int. Cl.³ B65H *54/02, 67/04*
U.S. Cl. 242—25 A **3 Claims**



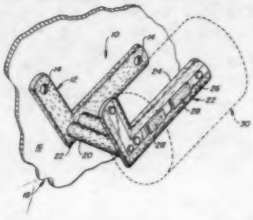
1. A method of controlling a shroud positionable by shroud drive means between a snagger covering position about a strand takeup reel being driven by a motor and a snagger uncovering position aside the strand takeup reel, and with the method comprising the steps of sensing the output speed of the strand takeup reel motor while the shroud is positioned in the covering position about the strand takeup reel and generating and inputting a shroud retraction signal to the shroud drive means upon sensing the speed of the motor to have been reduced to a preselected rate.

4,373,682

HOLDER FOR TOILET PAPER ROLL

Robert A. Dickson, 33A Knowles Ave., Daly City, Calif. 94014

Filed Sep. 18, 1980, Ser. No. 188,421
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.2 **14 Claims**



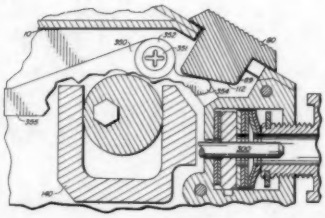
1. A holder for a toilet paper roll having a central cardboard tube comprising: a bracket adapted to be secured in a fixed position and having means thereon at one end thereof for hingedly mounting the bracket on an adjacent support for rotation about a generally horizontal axis; a spindle mounted on the bracket in a cantilever fashion and adapated to removably receive the cardboard tube of a toilet paper roll; and means including a piece of resilient sponge material mounted on the spindle for frictionally engaging the inner surface of the cardboard tube of the roll.

4,373,683

SNAP-IN SELF-CENTERING MECHANISM BUTTON

Robert A. Kyker, Collinsville, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 25, 1979, Ser. No. 88,032
Int. Cl.³ A01K *89/01*
U.S. Cl. 242—84.21 R **45 Claims**



9. In a plate having spaced upper and lower surfaces and a rectangular passage between the two surfaces, first and second long sides of the rectangular passage, extending between the two surfaces, a button slidably mounted in the passageway comprising:

(a) a head mounted exterior of the upper surface;

(b) a lower portion having a top secured to the head and a base projecting through the passageway, the portion having first and second longitudinal spaced walls, wedge means mounted on the first wall, step means mounted between the head and the wedge means, cantilever arm means mounted on the second wall and plane means mounted on the arm means near the head and projecting outwardly from the arm;

(c) first means for maintaining the plane means in contact with the first side of the passageway;

(d) friction means for retaining the button in any preselected position by cooperative engagement of the plane means in contact with the first long side and step means in contact with the second long side;

(e) second means for retaining the button in the passageway.

43. An open face spinning reel having a housing, selectively operable means in said housing controlled by a movable button operable externally of the housing, and means for mounting said button on said housing for retention in one or more selected positions including a passageway formed in the wall of the housing, said button having a head mounted exteriorly of the housing and a lower portion with a base projecting through the passageway, the lower portion having first and second walls extending lengthwise thereof, wedge means on said first wall having a surface underlying and engageable with the interior of the housing wall along one side of the passageway, arm means connected to the second wall and yieldably extending outwardly away from said second wall toward a second side of the passageway opposite said one side with a part positioned in and urged toward said second side of the passageway and an angled surface adjacent and underlying the interior of the housing wall along said second side of the passageway, and coacting means on said part and the surface of said passageway for holding the button in a selected position and releasable by yielding of said arm means.

4,373,684

BELT RETRACTOR

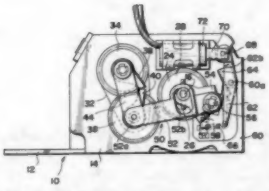
Katsumi Naito, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd. and NSK-Warnar K.K., both of, Japan

Filed Sep. 24, 1980, Ser. No. 190,281

Claims priority, application Japan, Sep. 27, 1979, 54-132526[U]

Int. Cl.³ A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107.6 **7 Claims**



1. A belt retractor including a frame structure, a reel shaft having thereon a belt reel with a coil of seat belt wound thereabout, said reel shaft secured to said frame structure for rotation in a first direction when said seat belt is pulled out of said belt reel and spring-biased for rotation in a second direction to retract said seat belt around said belt reel, said belt retractor comprising:

(a) lock means movable into driving connection with said reel shaft to prevent rotation of said reel shaft in the second direction while permitting said reel shaft to rotate through a predetermined angle in the first direction and to rotate back through said predetermined angle in the second direction; and

(b) drive means for bringing said lock means into driving connection with said reel shaft when said seat belt is worn, said drive means including link means spring-biased toward a first position where it removes said lock means from driving connection with said reel shaft, said link means being movable with rotation of said reel shaft in the second direction toward a second position where it brings said lock means into driving connection with said reel shaft, control means spring-biased toward a first position where it restricts the movement of said link means toward its second position, said control means being movable to a second position where it permits said link means to move to its second position and holds said link means in the second position, and actuator means for providing a force to bring said control means to its second position when said seat belt is worn.

4,373,685

STRAND CARRIER

George M. Hutchinson, Hartwell, Ga., and Robert L. Burchette, Jr., Spartanburg, S.C., assignors to LHP Corporation, Hartwell, Ga.

Filed Dec. 18, 1980, Ser. No. 218,005

Int. Cl.³ B65H *75/14*

U.S. Cl. 242—118.6 **9 Claims**

1. An improved strand carrier comprising:

(a) a barrel, said barrel having an outside wall defining a strand receiving surface and an inside wall defining an axial opening therethrough;

(b) an enlarged head secured to at least one end of said barrel defining an opening in communication with said barrel opening, said head further having carrier receiving means thereon; and

(c) a molded, mineral filled polymeric bushing received within said barrel and secured thereto, said polymeric bushing defining a spindle receiving opening therethrough and being high temperature and creep resistant whereby when said carrier is employed in an operation wherein a strand is wound around said carrier at speeds in excess of 18,000 revolutions per minute, without physical change to the bushing.

4,373,686

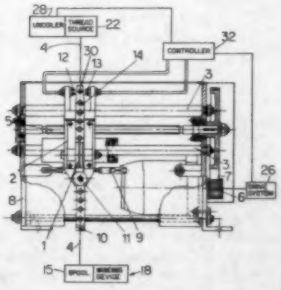
SYSTEM FOR THREAD GUIDING IN WINDING MACHINES

Ottavio Milli, 17 Piazza Dante, Grosseto 58100, Italy

Filed Nov. 28, 1979, Ser. No. 98,239

Int. Cl.³ B65H *54/28*

U.S. Cl. 242—158.2 **9 Claims**



1. A system for guiding a thread in a winding machine, the thread being fed from a feed source and being wound upon a winding spool of a winding device, the spool having side walls, a center and a longitudinal axis and the thread being wound in the spool in layers of side by side turns laid one on top of another, the system comprising:

a carriage rolling upon fixed, linear guides and being dis-

placeable along the guides in two opposed directions, the guides being arranged parallel to the longitudinal axis of the spool;

drive means for displacing the carriage in the two opposed directions at a substantially continuous speed;

a guide roller carried on the carriage and rotatable in a direction substantially normal to the displacement directions of the carriage, the guide roller engaging with the thread and being rotated by the thread as the thread passes from the feed source to the spool;

an elongate lever pivotally mounted on the carriage, the lever including one end defining a fork through which the thread passes, the fork being arranged between the guide roller and the spool and the lever including another end extending opposite the one end a sufficient distance to amplify any motion of the one end, the lever being pivoted by lateral movements of the thread transmitted through the fork;

detector means located adjacent the other end of the lever for detecting any pivoting of the lever and providing control signals indicating the same;

control means for reversing the displacement of the carriage at the instant of the control signals; and

blocking means supported by the winding device of the winding spool, the blocking means including flanges extending inwardly of the spool side walls toward the center of the spool and defining contact planes precisely engageable against the thread as it is wound on the spool adjacent the side walls, the blocking means for imparting lateral movements to the thread when engaged therewith;

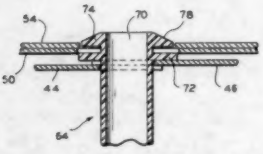
so that the lateral movements precisely imparted to the thread at the ends of the spool by the flanges cause a pivoting of the lever through the fork, the amplified movement of the other end of the lever being detected by the detector means and providing control signals indicating the same and the control means reversing the displacement of the carriage at a precise instant to commence the laying of a new layer of turns free of irregular superpositions of turns at the spool sidewalls.

4,373,687

DISPENSING CONTAINER

James A. Zicko, Natick, Mass., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 1, 1981, Ser. No. 250,084
Int. Cl.³ B65H *55/00, 57/12*
U.S. Cl. 242—163 **4 Claims**



1. A dispensing container for coiled strand material comprising in combination:

a pair of opposed major side walls and a pair of opposed minor side walls;

end closure flaps connected to end edges at one end of each said major and minor side walls and foldable to form an end of the container;

a pair of underlying closure flaps connected to other end edges of said minor side flaps, each of said underlying closure flaps having an arcuate cut-out and adapted to be folded inwardly in overlapping relation with each other to provide an aperture;

a die-cut closure flap connected to the outer end edge of one of said major side walls;

a coil of strand material wound in a plurality of figure-8s for payout from the interior of the coil;

a hollow feed tube guide extending radially through the body of the coil and having a bore through which the free end of the strand material is passed as it is being unwound, said tube guide having an annular flange and a pair of projections spaced from said flange;

said underlying flaps frictionally engaging the outer surface of the tube guide, said die-cut flap being interlockingly engaged between the flange and projections of said tube guide; and

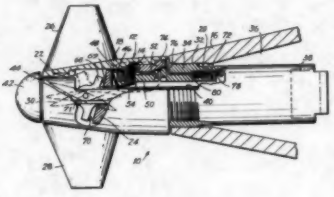
an outermost closure flap conneted to the other end edge of the other major side wall, said outermost flap having a circular perforated area for engaging the outer end of the tube guide for protecting it during shipment.

4,373,688

CANARD DRIVE MECHANISM LATCH FOR GUIDED PROJECTILE

Roger O. Topliffe, Amherst, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1981, Ser. No. 225,596
Int. Cl.³ F42B *15/16*
U.S. Cl. 244—3.24 **6 Claims**



1. A guidance mechanism for a projectile of the type which imparts a spin to at least a portion of the guidance mechanism during launch which spin is reduced by despinning after launch, said guidance mechanism including at least one deflectable canard and a canard drive mechanism for deflecting said at least one deflectable canard with respect to said projectile, and a drive mechanism lock comprising:

means for immobilizing said canard drive mechanism prior to launch;

means for releasing said means for immobilizing under launch acceleration of said projectile; and

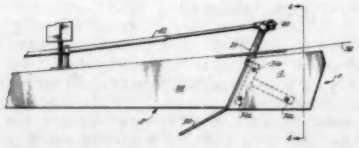
means for maintaining said means for immobilizing effective until said spin is reduced to a predetermined value.

4,373,689

TWO-AXIS RUDDER TRIM FOR AIRCRAFT

Robert A. Walker, 17130 Roscoe Blvd., Los Angeles, Calif. 91325

Filed Jul. 16, 1980, Ser. No. 169,405
Int. Cl.³ B64C *5/10*
U.S. Cl. 244—87 **1 Claim**



1. A two axis trim element for aircraft comprising:

a rotatable shaft extending from the rear portion of the underside of the aircraft;

an elongated, generally horizontal surface element having a downwardly-canted tab portion formed into the leading end thereof extending along the longitudinal axis of the aircraft;

an elongated vertical surface element attached at the port side of the horizontal surface element;

means for securing the vertical surface element to the shaft for swivelly mounting the trim element;

control means extending between the shaft and an operator's control position for enabling an operator to adjust the angle of attack of the trim element; and

an upwardly-canted portion formed into the horizontal surface toward the rear of the starboard side thereof opposite the vertical surface element, said canted portion being angled obliquely relative to the direction of elonation of the horizontal surface whereby the element functions to trim the aircraft about the pitch and yaw axes.

4,373,690

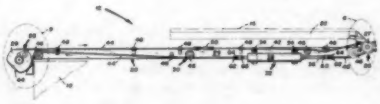
DEPLOYABLE SUPPORT STRUCTURE FOR SPACECRAFTS

Lee E. Stillman, Lancaster, Va., and Thomas G. Coughlin, Ellicott City, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1979, Ser. No. 32,580

Int. Cl.³ B64G *1/30, 1/10*

U.S. Cl. 244—173 **20 Claims**



1. A deployable support structure for use in conjunction with a spacecraft comprising:

an elongated arm providing a supporting surface;

first driven pivot means for pivotally connecting one end of said arm to said spacecraft, said first driven pivot means including a drive pulley, said arm being positionable adjacent to said spacecraft and extensible therefrom upon driving of said drive pulley of said first driven pivot means;

linear actuator means for mechanically storing and selectively releasing energy, said linear actuator means having a movable assembly defined by two spaced apart preselected points identifiable thereon, release of the energy stored by said linear actuator means causing said assembly to move, each of said two points shifting a preselected distance along a straight line in the same direction upon said movement; and

means for coupling said linear actuator means to said drive pulley of said first driven pivot means, said coupling means comprising a length of flexible cable forming a loop, said cable operably engaging said drive pulley and being affixed on the ends thereof to said first and second preselected points, releasing of energy from said linear actuator means thereby driving said first driven pivot means.

4,373,691

DECOUPLING ARRANGEMENT FOR NON-INSULATED AC TRACK CIRCUITS IN RAILWAY SYSTEMS

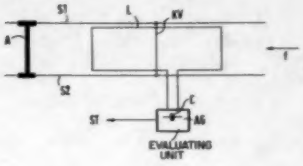
Hans Fricke, Wolfenbüttel; Jürgen Kiess, Gerlingen, and Lutz Schulmeyer, Stuttgart, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,303

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951124

Int. Cl.³ B61L *12/06*

U.S. Cl. 246—34 CT **9 Claims**



1. A decoupling arrangement for non-insulated AC track circuits in a railway system comprising:

a short circuiting cross bond connected between both rails of a track of said railway system;

at least one conductor loop disposed between said rails in the immediate vicinity of said cross bond and inductively coupled to said cross bond and to portions of said rails adjacent said cross bond to perform one of the following two operations (1) feed alternating current having a predetermined frequency into said rails or (2) couple said alternating current from said rails.

4,373,692

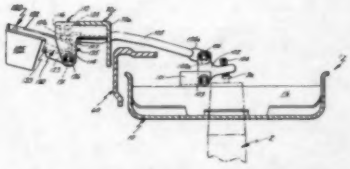
CHAIR CONTROL WITH HEIGHT ADJUSTMENT ACTUATOR

Jack R. Knoblauch, Byron Center; Duane M. Beukema, Grand Rapids, and Kenneth W. Hozeski, Grandville, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed May 1, 1980, Ser. No. 145,623

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—162.1 **26 Claims**



1. In a chair control having a stationary member for mounting on a height adjustable chair base, which base has a height adjustment actuator at the top thereof, said stationary member having mounting means for securing to the top of said chair base, and said chair control having a tiltable member pivotally mounted relative to said stationary member for securing to a chair seat, the improvement comprising: linkage means pivotally mounted at one end adjacent said mounting means whereby when said chair control is located in place atop a chair base, the height adjustment actuator of said chair base is engaged by said linkage means; said linkage means being pivotally connected at its other end to said tilting member of said chair control and extending to the exterior of said tilting member; handle means operably connected to said extending end of said linkage means whereby a user seated in a chair to which said chair control is secured can readily actuate the height adjustment actuator on a chair base mounted underneath said

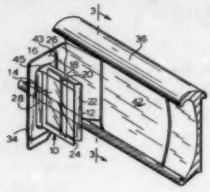
chair control by reaching under said chair and activating said handle.

4,373,693

SHELF MOLDING CLIP ASSEMBLY

William Greenberger, White Plains, N.Y., assignor to The Hopp Press, Inc., New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,537
Int. Cl.³ E04G 5/06
U.S. Cl. 248—221.4 **9 Claims**



1. A clip adapted for use with a shelf molding comprising:

a substantially planar, resilient mounting member having an appropriate shape for engaging the parallel flanges of a shelf molding said mounting member having a pair of diametrically opposed rounded corners whereby the mounting member may be twisted into engagement with the parallel flanges of the shelf molding;

a pair of resilient, opposing gripping arms substantially perpendicularly affixed to said planar member, said arms having inner surfaces defining a channel therebetween; and,

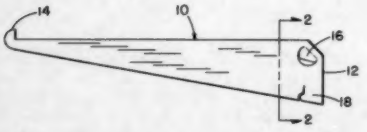
said arms being integrally constructed as one piece and connected to each other near their point of affixation to said planar member, each of said arms having an outer surface including a ridge thereon, said ridges being positioned approximately the same distance from said planar member and running parallel thereto, each of said ridges terminating prior to the point of affixation of the arms to the planar member so as to define a pair of abutments running parallel to said planar member, said planar member and said abutments defining a pair of parallel recesses.

4,373,694

ADJUSTABLE SHELF SUPPORT

Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 20, 1981, Ser. No. 245,829
Int. Cl.³ A47G 29/02
U.S. Cl. 248—246 **5 Claims**



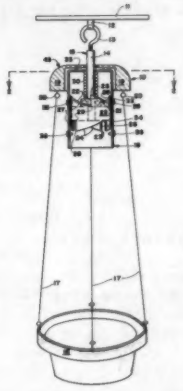
1. An adjustable shelf support comprising an elongated L-shaped standard for supporting a bracket, a first leg of said L-shaped standard having parallel protrusion means to prevent lateral movement of the bracket, said first leg adapted to be placed against and fastened to a vertical surface, a second leg of said L-shaped standard having a free end bent back toward said first leg to form parallel portions with a predetermined distance therebetween, a substantially planar bracket having a thickness substantially equal to said predetermined distance including a flat vertical edge for engaging said protrusion means, first and second finger means bent out of the plane of said bracket for engaging the secong leg of said standard, said first finger means to limit downward rotation of said bracket, said second finger means to limit upward rotation of said bracket, said second finger means being flexible so as to snap into a position adjacent to said free end of said second leg whereby upward rotation of said bracket causes said second finger means to move to a position between said parallel portions thereby positively preventing both continued upward rotation and lateral movement of said bracket.

4,373,695

APPARATUS FOR SUSPENDING A PLANTER

Bernard L. Faris, R.F.D. 1, Box 166, Glen Allen, Va. 23060

Filed Jun. 11, 1980, Ser. No. 158,421
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ F16M 13/00
U.S. Cl. 248—318 **10 Claims**



1. An apparatus to be pendantly supported from an overhead support for rotatively suspending an object therebelow comprising an outer member having a circular cylindrical configuration, an internal member slideably housed within said outer member and adapted for linear movement relative to said outer member along the vertical center axis thereof, and position restoring means interactively engaging said members in a manner such that one of said members is caused to rise when no significant downward force is applied thereto, each member being provided with attachment means for suspending an object from an overhead support, said internal member being comprised of a shaft coaxially disposed with said center axis and opposed spaced upper and lower circular arrays of teeth, said arrays being coaxially and immoveably secured to said shaft and possessing equal numbers of uniformly spaced vertically disposed teeth in a sawtooth configuration, each tooth having a vertical edge parallel to said center axis and a contiguous angled edge meeting with said vertical edge as an apex at the outermost reach of said tooth and meeting with the next adjacent vertical edge to form a substantially V-shaped bight at the base of said teeth, the direction of the angled edges of the teeth of one array being opposite to the direction of the angled edges of the teeth of the opposed array, said arrays being aligned such that the vertical edges of the teeth of one array are opposite the angled edges of the teeth of the opposed array and the apexes of the teeth of one array are upwardly directed while the apexes of the teeth of the other array are downwardly directed, said outer member possessing at least one inwardly directed bearing means adapted to interact with said teeth and capable of supporting said internal member, whereby one member rises when downward force is removed there-

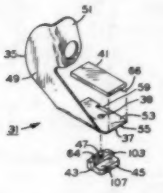
from, causing said bearing means to engage the angled edges of the teeth of one array and traverse said edges while rotating said shaft until stopping at bights in said array, and said risen member descends when downward force is restored thereto, causing said bearing means to engage the angled edges of the teeth of the opposed array and traverse said edges while rotating said shaft until stopping at bights in said opposed array.

4,373,696

MOTOR MOUNTING ARRANGEMENT, DEVICE FOR MOUNTING A MOTOR, AND METHODS

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 4, 1980, Ser. No. 156,275
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—604 **27 Claims**



1. A method of manufacturing a torsionally flexible vibration isolating device adapted for mounting an electric motor, the device having a pair of weldable members adapted to cooperate as heat sink means, and a flexible mounting arm including a motor end flange having a pair of opposite surfaces with an opening extending therebetween through the motor end flange, the method comprising the steps of:

lancing at least one tab from the motor end flange of the mounting arm generally adjacent the opening therein and in a direction away from one of the opposite surfaces of the motor end flange;

providing one of the weldable members with a pair of projections arranged generally in an L-shaped configuration with respect to each other;

inserting one of the projections into the opening in the motor end flange and locating the other of the projections adjacent the other of the opposite surfaces of the motor end flange in predetermined spaced relation therewith and so as to extend generally in a direction away from both the at least one tab and the opening;

disposing the other of the weldable members in overlaying relation at least adjacent the one opposite surface of the motor end flange and interfacing the other weldable member with the one projection on the one weldable member inserted into the opening in the motor end flange;

associating a pair of electrodes with the weldable members and urging the weldable members toward each other with the motor end flange interposed therebetween;

passing a welding current through the weldable members so as to weld the one projection on the one weldable member to the other weldable member at the interface therebetween; and

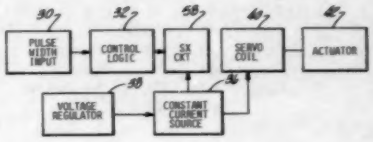
dissipating welding heat caused by the welding current along the heat sink means so as to prevent excessive heat transmission to the mounting arm.

4,373,697

PULSE WIDTH MODULATED CONSTANT CURRENT SERVO DRIVER

Weldon L. Phelps, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01751, § 371 Date Dec. 29, 1980, § 102(e) Date Dec. 29, 1980, PCT Pub. No. WO82/02236, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 29, 1980, Ser. No. 275,074
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—129 **3 Claims**



1. In an apparatus for controlling an hydraulic servo valve (48) having a coil (40) operated output (42) responsive to control signals for producing hydraulic output pressures (P_o) respectively proportionate to the duty factors (t_1/t_2) of said control signals, and means (30, 32) for producing said control signals, the improvement comprising:

a DC voltage supply (50) such as a battery which is subject to variations in output voltage level;

regulator means (38) connected to the supply (50) to provide a regulated voltage;

a constant current generator circuit (36) connected to receive the regulated voltage for producing a current output constant magnitude which is substantially independent of variations in the voltage from said supply (50);

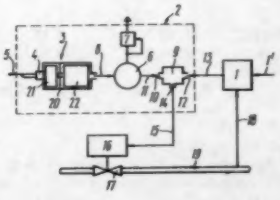
and variable duty cycle switch means (58) interconnecting the constant current generator circuit (36) with the coil (40) to apply current pulses of constant magnitude but variable duration to the coil (40).

4,373,698

SHUTOFF VALVE ACTUATOR REMOTE CONTROL SYSTEM

Veniamin M. Anisimov, ulitsa Dekabristov, 15, kv. 6, Biisk Altaiskogo kraya; Valentin V. Belov, Klenovy bulvar, 8, kv. 47; Vsevolod I. Verkevich, ulitsa Moldagulovoi, 18, korpus 2, kv. 254, both of Moscow, and Jury E. Orionov, ulitsa Dekabristov, 12, kv. 13, Biisk Altaiskogo kraya, all of U.S.S.R.

Filed Aug. 20, 1980, Ser. No. 179,690
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—26 **1 Claim**



1. A shutoff valve actuator remote control system with an emergency control line and comprising:

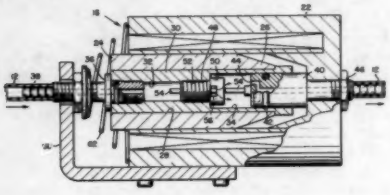
a main control apparatus having an outlet; and

a transportable duplicating control apparatus connected with said main control apparatus;

wherein said duplicating control apparatus comprises:

a self-contained power source in the form of a gas generator with an igniter connected to said emergency control line, said gas generator having an outlet;
a safety valve;
a receiver connected with said safety valve and having an outlet and an inlet connected with said outlet from the gas generator; and
a commutator having a first inlet connected with said outlet from the main control apparatus, a second inlet connected with said outlet from the receiver, and an outlet connected with said shutoff valve actuator.

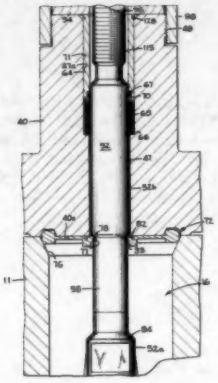
4,373,699
FLUID FLOW CONTROL VALVE FOR DENTAL INSTRUMENTS
Hermann Leiberich, Karlsruhe, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 15, 1980, Ser. No. 149,909
Int. Cl.³ F16K *31/06*
U.S. Cl. 251—139 **4 Claims**



1. A fluid flow control valve for varying the flow of fluid in a range from zero to maximum flow directly responsive to an applied voltage said valve comprising:
(a) a solenoid including a coil and a core;
(b) said core having a fluid passage extending axially therethrough, the inlet of said passage being adapted for connection to a source of fluid under pressure and the outlet of said passage being an exit for fluid flowing through said core;
(c) valve means fixed to said core within said axial passage for movement with said core, said valve means being located between said inlet and outlet wherein the movement of said core responsive to a voltage applied to said coil opens said valve means and permits fluid flow through said axial passage; and
(d) means in said axial passage down stream from said valve mans for creating fluid pressure in said axial passage responsive to the flow of fluid therethrough, said fluid pressure acting on said core in a direction for offsetting the magnetic force induced in said core by the voltage applied to said coil.

4,373,700
METAL SEAL FOR A GATE VALVE STEM
Ervin A. Buchta, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.
Filed Feb. 25, 1981, Ser. No. 238,250
Int. Cl.³ F16K *41/14, 41/16*
U.S. Cl. 251—214 **12 Claims**

1. A valve comprising:
a body having a fluid flow passage extending transversely therethrough between an inlet and an outlet of said passage, and a gate chamber extending through a portion of said body at right angles to and intersecting said fluid flow passage;
a valve gate having a port therethrough;
means for slidably mounting said valve gate in said valve body to connect said passage outlet to said passage inlet through said valve gate port when said valve gate is in a first position, said valve gate blocking the flow of fluid between said passage inlet and said passage outlet when said valve gate is in a second position;
a bonnet mounted on said valve body to enclose said gate chamber, said bonnet having a bore therethrough;
a metallic sealing member mounted between said body and said bonnet, said sealing member having a bore therethrough;
a gate stem mounted through said bore in said bonnet and through said bore in said sealing member, said gate stem having first and second enlarged portions, said first enlarged portion forming a fluid-tight seal with said sealing

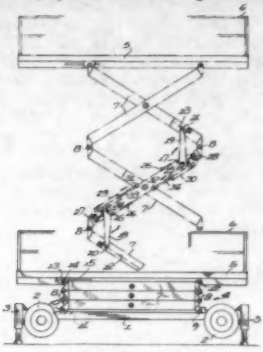


member when said stem is in a fully extended position and said second enlarged portion forming a fluid-tight seal with said sealing member when said stem is in a fully retracted position, said first and said second enlarged portions of said gate stem each including a wedge-shaped cam surface which mates with a wedge-shaped cam surface on said metallic sealing member to form said fluid-tight seal between said gate stem and said metallic sealing member when said gate stem is either fully retracted or fully extended; and
means for connecting said stem to said valve gate.

4,373,701
LIFTING APPARATUS
Mitsuhiro Kishi, 1320 Mizuhonocho, Ashikaga-shi, Tochigi-Pref., 326-03, Japan
Filed Nov. 28, 1980, Ser. No. 210,872
Int. Cl.³ B60P *1/02*
U.S. Cl. 254—122 **6 Claims**

1. A lifting apparatus comprising:
a foundation,
a work platform, and
a pantographic lifting mechanism operatively coupled between foundation and said work platform for elevating said work platform away from said foundation, said pantographic lifting mechanism including a plurality of pivotally coupled X-link units, each X-link unit having a pair of transversely spaced scissor linkages pivotally connected as at a midportion thereof, a first pair of lever arms having one pair of corresponding portions pivotally connected respectively to a first pair of transversely spaced scissor linkages of one of said X-link units and another pair of corresponding end portions of said first pair of lever arms being connected in rolling engagement at all times with a second pair of transversely spaced scissor linkages of a second of said X-link units, a second pair of lever arms having a first pair of corresponding end portions pivotally connected respectively to a first pair of transversely spaced scissor linkages of one of said X-link units and another pair of corresponding end portions in rolling

engagement at all times with a third pair of transversely spaced scissor linkages of a third of said X-link units, said first and second pairs of said lever arms being disposed one on each side of the midportion of said one of said X-link units, and actuator means mounted on said first pair of transversely spaced scissor linkages and actuatable to



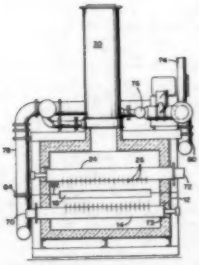
move said first and second pairs of said lever arms in unison about said one ends thereof, whereby when said actuator means is actuated, said other ends will roll along said second and third transversely spaced scissor linkages to forcibly extend said X-link units with respect to each other.

4,373,702

JET IMPINGEMENT/RADIANT HEATING APPARATUS

Viswanath Jayaraman, Livonia, Mich., and Carroll Cone, Toledo, Ohio, assignors to Holcroft & Company, Livonia, Mich.

Filed May 14, 1981, Ser. No. 263,630
Int. Cl.³ C21D 9/56
U.S. Cl. 266—111 **9 Claims**



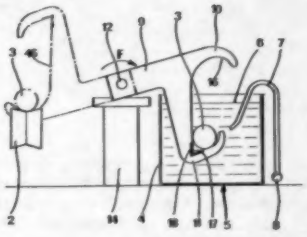
1. Apparatus for heat-treating flat metal stock comprising an insulated compartment having an entry slot and an exit slot formed in opposite endwalls of said compartment; means for introducing said flat stock into said compartment through said entry slot and for removing said stock through said exit slot such that said stock traverses said compartment along a plane; a first array of tubes of heat-resistant material disposed in spaced relationship to each other equidistant from and beneath said plane, said tubes each extending across at least a portion of the width of said compartment and having a row of perforations formed along the upper surface thereof confronting said plane; a second array of tubes of heat-resistant material disposed in spaced relationship to each other equidistant from, and above said plane, said second array of tubes each extending across at least a portion of the width of said compartment and having a row of perforations formed along the lower surface thereof confronting said plane; each of said tubes of said arrays having a closed end; and a burner positioned adjacent the end of each of said tubes opposite said closed end for generating heated products of combustion within said tubes to heat said tubes to radiance and to eject said heated products of combustion as jets emanating from said perforations, whereby said metal stock is heated by radiation from said tubes and by convection heat transfer by the impingement of said jets upon said stock.

4,373,703

DEVICE FOR RAPIDLY COOLING METAL TUBES

Philippe Perineau, Aubervilliers, and Yves Lebreton, Aulnoye, both of France, assignors to Vallourec, Paris, France

Filed Feb. 16, 1982, Ser. No. 349,050
Claims priority, application France, Feb. 27, 1981, 81 04380
Int. Cl.³ C21D 1/62
U.S. Cl. 266—131 **16 Claims**



1. In a device for rapidly cooling hot metal tubes comprising means for transferring hot tubes upstream, a quenching tank, an immersion device means for transferring the hot tubes to the immersion device, means for clamping the tubes, and means for recovering, removing and transferring the cold tubes downstream, the improvement wherein said immersion device comprises a longitudinal deflector positioned straight below the tube to be treated in order to cause a symmetrical circulation of the cooling liquid around the tube during the descent phase into the tank, and an air injection system fastened to one end of the tube to be treated, said injection system being adapted to blow air at a fast flow rate into the tube during the phase that the tube is descending into the tank and is maintained immersed.

4,373,704

APPARATUS FOR REFINING MOLTEN METAL

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 12, 1980, Ser. No. 158,771
Int. Cl.³ C22B 21/06
U.S. Cl. 266—225 **6 Claims**

1. In an apparatus for refining molten metal comprising, in combination:

(a) a vessel having an inlet zone and an outlet zone; at least two refining compartments in between, connected in series, separated by baffles, and positioned in such a manner that the first refining compartment in the series is adjacent and connected to the inlet zone and the last refining compartment in the series is adjacent and connected to the outlet zone; and dross removal means; and

(b) one rotating gas distributing device disposed at about the center of each refining compartment, said device comprising a shaft having drive means at its upper end and a rotor fixedly attached to its lower end, the upper end being positioned in the top section of the compartment and the lower end being positioned in the bottom section of the compartment,

the improvement comprising:

(1) positioning the inlet zone and the outlet zone in such a manner that the molten metal is permitted to flow from the bottom of the inlet zone to the bottom section of the first refining compartment in the series and from the top section of the last refining compartment in the series to the top of the outlet zone; and

(2) utilizing for each separating baffle, a baffle consisting of first and second baffles bearing a spaced relationship to one another and positioned in such a manner that (i) the first baffle is on the inlet side of the vessel and the second baffle is on the outlet side of the vessel and (ii) molten metal is permitted to flow from the top section of one refining compartment over the top of the first baffle into the space between the first and second baffles and under the second baffle into the bottom section of the next refining compartment in the series.

4,373,705

METHOD AND APPARATUS FOR SEPARATING SLAG AND POURING MOLTEN STEEL OUT OF A CONTAINER SUCH AS A CONVERTER OR THE LIKE

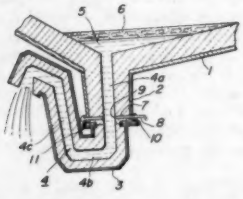
Hirosuke Yamada, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Dec. 29, 1980, Ser. No. 221,351

Claims priority, application Japan, Dec. 27, 1979, 54-169130

Int. Cl.³ F27D *3/14*

U.S. Cl. 266—227 **7 Claims**



1. In a method of separating slag and pouring molten steel out of a container such as a converter or the like, comprising guiding the molten steel into a U-shaped passage composed of a descending portion communicated with a molten steel outlet opening of the container, an intermediate portion and an ascending portion communicated with an outlet opening of the U-shaped passage and secured to and located at the lower side position of the container when it is tilted into its tapping position after the refining has been completed, the U-shaped passage being operative to keep the static pressure of the residual molten steel in balance with the static pressure of the residual slag, the improvement which comprises jetting an inert gas which does not positively react with the molten steel directly into the flow of the molten steel in said descending portion of the U-shaped passage, the amount of flow of the jet gas being at most 5 Nm^3/min, whereby the jet gas causes the flow speed of the molten steel to retard so as to eliminate the influence of the inertia force of the flow of the molten steel exerted to said balance between the static pressure of the residual molten steel and the static pressure of the residual slag in said U-shaped passage and effect a complete separation of the slag and molten steel.

4,373,706

APPARATUS FOR HEAT TREATMENT OF MATERIAL TO BE WORKED ON, ESPECIALLY OF ALUMINUM OR MAGNESIUM ALLOYS

Friedrich W. Elhaus, Jägerstrasse 117a, D-56 Wuppertal 1, Fed. Rep. of Germany, and Bernhard Hilge, Adliswil, Switzerland, assignors to Friedrich Wilhelm Elhaus, Wuppertal, Fed. Rep. of Germany and Prolizenz A.G., Chur, Switzerland

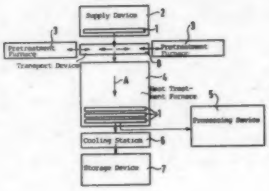
Division of Ser. No. 887,316, Mar. 16, 1978, Pat. No. 4,245,818, which is a continuation-in-part of Ser. No. 669,347, Mar. 22, 1976, Pat. No. 4,135,704, which is a continuation-in-part of Ser. No. 417,509, Nov. 20, 1973, Pat. No. 3,953,247. This application Sep. 16, 1980, Ser. No. 187,805

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1972, 2256978; Oct. 3, 1973, 2349765

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ C21D *9/08, 1/08, 1/767*

U.S. Cl. 266—252 **9 Claims**



1. In an apparatus for heat treatment of a metal piece or metal pieces to be subsequently worked on, such as ingots, billets, rods, tubes, cast strips and cast billets, especially of aluminum or magnesium alloys, wherein the pieces are preheated, each piece having a predetermined diameter, and thereafter the pieces are held at a predetermined heat treatment temperature for a predetermined time, comprising, in combination:

heating means operable for heating and preheating, respectively, said pieces,

a transport device movable in a transport direction, with relation to said heating means, including

a plurality of stationary beams, each of the beams being formed with a plurality of sawtooth-shaped depressions, each of the depressions having a bottom for receiving the pieces, and being at least partly defined by an oblique surface relatively slightly inclined with respect to the transport direction; and

a plurality of lifting beams disposed between the stationary beams, respectively, movable from a rest position below said lifting beams in a lifting direction, and independently thereof also in the transport direction, each of the lifting beams having a flat surface and a plurality of prismatic guards disposed on said surface at respective distances, each of said distances exceeding the diameter of each of the pieces, said pieces being liftable from said depressions by said lifting beams and lowerable in a controlled manner on the oblique surfaces of the succeeding depressions, respectively, as viewed in the transport direction, said pieces being thereupon freely rollable into the bottom of said depressions, said lifting beams being contactable by said pieces upon the pieces being disposed in said depressions, and subsequently movable in a controlled manner in a direction opposite to the lifting direction.

4,373,707

CONSTRUCTION INCLUDING A GAS SPRING

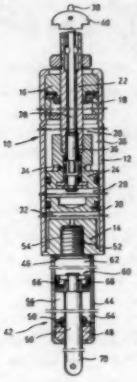
Werner Mölders, Plaidt, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,296

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948081

Int. Cl.[3] A47C 20/04; F16F 9/00, 9/54

U.S. Cl. 267—64.12 10 Claims



1. In a construction, including:

a stationary construction unit;

a movable construction unit movably mounted on said stationary construction unit;

a gas spring unit operatively connected to both said stationary construction unit and said movable construction unit, said gas spring unit including a cylinder member having two ends and a cavity defined therein, a piston rod member sealingly guided through an aperture in one of said ends, a piston connected to said piston rod member and defining two working chambers within said cavity, a pressurized fluid in said two working chambers, fluid passage means between said two working chambers, and valve means for opening and closing said fluid passage means;

first connecting means for connecting one of said members to one of said construction units;

second connecting means for connecting the other of said members to the other of said construction units;

the improvement comprising:

a gas spring device connected to the other of said members and to said second connecting means, said gas spring device including a cylinder element having two ends and a cavity defined therein, a piston rod element sealingly guided through an aperture in one end of said cylinder element, and a pressurized fluid in said cavity;

one of said cylinder and piston rod elements being connected to said other member of said gas spring unit, the other of said cylinder and piston rod elements being connected to the said second connecting means;

said piston rod member being movable along a path of movement with respect to said cylinder member between an innermost position and an outermost position, said pressurized fluid within said cylinder member exerting an expelling force onto said piston rod member towards said outermost position when said valve means are open, said piston rod member being lockable in a plurality of positions along said path of movement by closing said valve means;

said piston rod element being movable along a range of movement with respect to said cylinder element between an innermost position and an outermost position, said pressurized fluid within said cylinder element exerting an expelling force onto said piston rod element towards said outermost position;

said movable construction unit being lockable in a plurality of positions corresponding to said plurality of positions of said piston rod member with said piston rod element being in its innermost position;

said movable construction unit being further movable along an additional way of movement adjacent its respective locked position, said additional way of movement corresponding to said range of movement of said piston rod element;

said movable construction unit exerting a movement-resisting force on both said piston rod member and said piston rod element counteracting to said expelling forces exerted on said piston rod member and said piston rod element by pressurized fluid;

said expelling force exerted on said piston rod member exceeding said movement-resisting force along the path of movement of said piston rod member; and

said expelling force exerted on said piston rod element by pressurized fluid being smaller than said movement-resisting force at least when said piston rod element is in its innermost position.

4,373,708

THRUST ABSORPTION MECHANISM

Jorge Costa, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

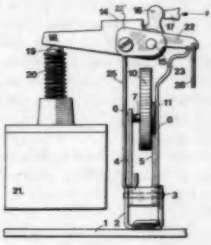
PCT No. PCT/CH79/00019, § 371 Date Oct. 7, 1979, § 102(e) Date Aug. 28, 1979, PCT Pub. No. WO79/00601, PCT Pub. Date Aug. 23, 1979

PCT Filed Feb. 6, 1979, Ser. No. 165,485

Claims priority, application Switzerland, Feb. 7, 1978, 1327/78

Int. Cl.[3] B41J 19/08, 21/06

U.S. Cl. 267—136 3 Claims



1. In a thrust absorption mechanism comprising a thrust piece (19) providing a stop for a moving body, said thrust piece (19) being displaced under the effect of the kinetic energy of said moving body against the action of a compression spring (20) and a shock absorber (21), a driving device (10,24) and retaining means (22,23) preventing the driving device from being engaged, the improvement wherein said retaining means (22,23) is released upon movement of said thrust piece (19), said mechanism comprises apparatus (5,12) for causing said device (10,24) to be engaged upon release of said retaining means (22,23), said driving device acting jointly with said moving body on said thrust piece (19) and driving said thrust piece in a controlled and predetermined movement, a bracket (2), a pin (3) fixedly mounted on said bracket, a first lever (4) rotatably mounted on said pin, said lever including a first arm (6) and a second arm (8), means connecting said second arm (8) to said thrust piece (19), said driving device comprising a cam (10) and a driving shaft (24), means for driving said shaft in continuous rotation, said cam (10) engaging said driving shaft (24) upon actuation of said apparatus (5,12), said cam comprising an eccentric roller (10) including a circular shoulder (11),

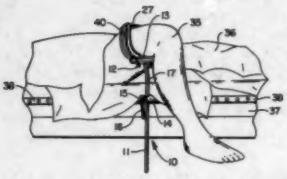
said apparatus comprising a second lever (5) and a draw spring (12), said second lever rotatably mounted at one of its ends on said fixed pin (3), the other end of said second lever (5) engaging said circular shoulder (11) of said eccentric roller (10), said draw spring (12) acting on said eccentric roller through said second lever (5) and biasing said eccentric roller (10) toward said driving shaft (24).

4,373,709

SURGICAL LIMB HOLDER

Everett D. Whitt, 3504 Rivercrest Dr., Columbus, Ohio 43223

Filed Sep. 24, 1980, Ser. No. 190,193
Int. Cl.[3] A61G *13/00*
U.S. Cl. 269—328 5 Claims



1. A limb holder for surgical procedures comprising:

(a) a vise constructed for attachment on a table means for the surgical procedures,

(b) a stanchion member comprising a generally vertically oriented rod-like leg constructed to adjustably slide and rotate in the vise and having a lateral support member fastened at the upper end, the leg having a deflection in form of less than 90° intermediate the vise and the lateral support member, to change the angle, attitude, and height of the limb holder upon adjustment in the vise, the vise having means for tightening the holding pressure on the stanchion and fixedly maintaining the angle, attitude and height of the limb holder,

(c) oppositely placed generally symmetrical restrainer members adjustably engaged on the stanchion member, the restrainer members having upstanding generally arcuate and limb conforming stays positioned to cooperatively support and restrain a limb; and

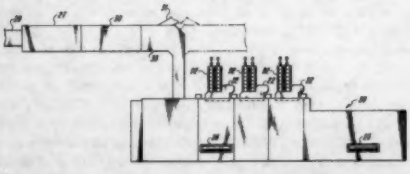
(d) clamping means on the limb holder, constructed to hold the restraining members at fixed positions on the lateral support member, the restrainer members being slidingly engaged on the lateral supports, and the clamping means being on the lateral supports.

4,373,710

APPARATUS FOR INSERTING SUPPLEMENTARY MATERIAL INTO NEWSPAPER JACKETS

Kenneth H. Hansen, Littleton, and Louis S. Conover, Jr., Aurora, both of Colo., assignors to Nolan Systems, Inc., Denver, Colo.

Filed Aug. 22, 1980, Ser. No. 180,368
Int. Cl.[3] B65H *5/30*
U.S. Cl. 270—55 9 Claims



1. An apparatus for conveying newspaper jackets in lapped orientation from a newspaper press to an assembly conveyor for later insertion of inserts into the newspaper jackets comprising in combination:

newspaper conveyor means for moving said newspaper jackets from the press in a lapped orientation;

means for speeding up said newspaper jackets relative to the speed of said newspaper conveyor means, said means for speeding up said newspaper jackets having an upstream end and a downstream end, said upstream end of said means for speeding up said newspaper jackets being adjacent to said newspaper conveyor means to thereby receive said newspaper jackets from said newspaper conveyor means so as to separate the lapped jackets;

an indexing conveyor having a plurality of pins mounted thereon, said indexing conveyor being adjacent to the downstream end of said means for speeding up said newspaper jackets, said pins adapted to abut a leading edge of said separated newspaper jackets upon receipt from said speed-up means;

sensing means for sensing the position of said newspaper jackets relative to said pins; and

means responsive to said sensing means for diverting selected ones of said newspaper jackets away from the indexing conveyor depending upon the position of the newspaper jacket relative to said pins.

7. A conveyor system comprising in combination:

a plurality of receptacle means for receiving and conveying vertically oriented newspaper jackets, each receptacle means having an uppermost opening for receiving said jackets and a lowermost opening for discharging said jackets together defining a vertically oriented opening through said receptacle means;

means operatively connected to each of said receptacle means for moving said receptacle means along a predetermined path;

support means positioned a spaced distance below the uppermost opening in each of said receptacle means along said predetermined path, said support means for supporting said newspaper jackets at said spaced distance below said uppermost opening in each of said receptacle means; and

means for adjusting the spaced distance of said support means relative to the uppermost opening in each of said receptacle means to accommodate various sized newspaper jackets.

9. In a conveyor system having a plurality of moving receptacle means for retaining a newspaper jacket into which an insert is to be fed by an insert feeder, wherein the improvement comprises:

means for sensing the failure to feed insert material into the receptacle means;

a photoelectric beam mounted at a fixed position at a starting position of the conveyor system, a reflector mounted at a fixed position on said receptacle means, said reflector adapted to be sensed by said photoelectric beam, and a shift register adapted to monitor the position of said receptacle based on input signals from said photoelectric beam striking said reflector, whereby said photoelectric beam, said reflector and said shift register define means for tracking the receptacle means from said starting position to a preselected location;

control means responsive to said means for sensing the failure of said insert feeder to feed an insert, said control means further adapted to respond to said means for tracking the position of said receptacle;

means operated by said control means for securing a newspaper jacket in a receptacle if an insert is not fed into the jacket; and

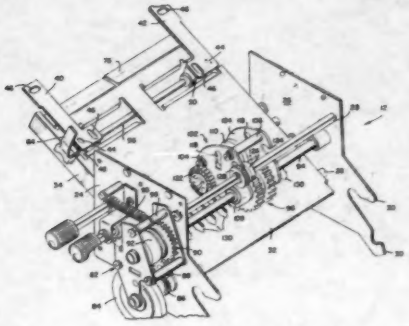
means operated by said control means for releasing said newspaper jacket at said preselected location.

4,373,711

INSERTER FEEDER ASSEMBLIES

Dean H. Foster, Stratford, and Harold Silverman, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 11, 1980, Ser. No. 185,857
Int. Cl.³ B65H 1/00
U.S. Cl. 271—171 6 Claims



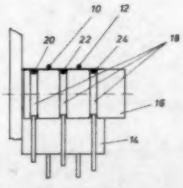
1. A feeder assembly for selectively feeding successive sheet material from a stack, the feeder assembly comprising a tray for carrying the stack of sheet materials, means forming a pair of guides for engaging the stack, means adjustably securing each guide relative to the tray, said securing means including means for adjusting the guides relative to one another for parallelism, the securing means including a pair of carrier means, each guide being secured to a respective carrier means, and means for simultaneously moving both carrier means for symmetrical placement of the guides relative to the tray, means for retaining the guides in an adjusted position, the retaining means including friction means extending from one carrier means and means biasing the friction means toward the underside of the tray, means mounting the tray in a sloped plane and guide biasing means for urging one end of each guide in a direction perpendicular from the plane of the tray, the guide biasing means comprising shoe means engaging the underside of each guide adjacent the upper end of the tray, whereby feeder assembly set-up is simplified.

4,373,712

APPARATUS FOR TRANSPORTING SHEET MATERIAL

Wilhelm Mitzel, Neukeferloh, Fed. Rep. of Germany, assignor to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Oct. 5, 1979, Ser. No. 82,314
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923148
Int. Cl.³ B65H 5/02
U.S. Cl. 271—272 9 Claims



1. Apparatus for transporting sheets of material in a path from an input to a discharge, the path being bent resulting in a set back of the sheets as they traverse bends in the path, said apparatus comprising:

a plurality of direction changing rollers lying along the path and defining bends therein said rollers being of differing diameters; and

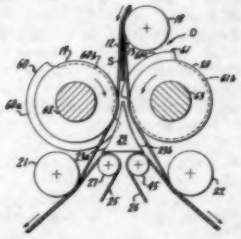
a sheet transporting belt means extending across said rollers for transporting the sheets along the path, the arcuate contact angle (α) between said belt means and roller at each of said rollers being selected in accordance with the diameter (d) of the roller such that the sheets at each of said rollers are subjected to the same amount of set back, said rollers being so positioned along said path that the sheets are continuously contacted by at least one roller.

4,373,713

DIVERTER MECHANISM

Michael H. Loebach, Red Lion, Pa., assignor to Motter Printing Press Co., York, Pa.

Filed Dec. 24, 1980, Ser. No. 219,829
Int. Cl.³ B65H 29/60, 29/68
U.S. Cl. 271—303 5 Claims

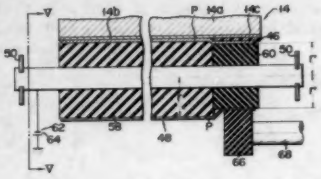


1. A cut sheet handling system comprising a pair of sheet feeding tapes guided for movement in a closed path, means for guiding the tapes in converging paths to receive the cut sheets seriatim and then guiding the tapes in side-by-side relation along a sheet feeding span and then guiding the tapes in diverging paths to release the sheets, a guide having a tapered upstream end interposed between the diverging paths of the sheet feeding tapes, a pair of concave diverging sheet guiding surfaces on the guide extending in diverging paths from the tapered upstream end thereof, rotary guide rolls having their outer convex surfaces adjacent and spaced apart from each of the guiding surfaces to guide each of the tapes in closely spaced apart relation to the guiding surfaces to define a sheet feeding channel therebetween, rotary diverters mounted coaxially with the tape guiding rollers and having raised cam surfaces which cooperate with the more remote tapes to define converging surfaces to guide the leading ends of the sheets past the upstream tapered end of the guide and into the channel defined by the more remote tape and the adjacent guiding surface, the upstream end of the guide and the raised cam surfaces intermeshing to permit the cam surfaces to recess beneath the guiding surfaces after guiding the leading ends of the sheets thereto, thereby releasing the leading end of the sheet within the appropriate channel, the circumferential length of each raised cam surface permitting it and the cooperating more remote tape to guide and support each sheet upstream of the tapered end of the guide through a substantial length of the sheet so that the portion of the sheet upstream of the leading end will not whip or be damaged or be permitted to enter the wrong path.

4,373,714
TRANSFER DEVICE

Shinichi Hashimoto, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 4, 1981, Ser. No. 240,284
Claims priority, application Japan, Mar. 5, 1980, 55-27645; Mar. 5, 1980, 55-27646
Int. Cl.³ B65H *29/56*
U.S. Cl. 271—310 14 Claims



1. A transfer device for an electrostatic copying apparatus including a rotatable photosensitive drum having a first peripheral layer on which a toner image is formed and a second peripheral layer which is coaxially adjacent to said first peripheral layer along a rotating axis of said drum and on which a toner image is not formed, and a peeling mechanism for peeling a copying paper from said photosensitive drum, said transfer device comprising:

a transfer roller which is rotatably disposed in opposition to said photosensitive drum and cooperates with said photosensitive drum to nip the copying paper therebetween, said transfer roller including a first roller portion in opposition to said first peripheral layer of said photosensitive drum and a second roller portion coaxial with said first roller portion, and

means for applying a surface electrical potential to said transfer roller to electrically attract the visible image from said photosensitive drum to the copying paper,

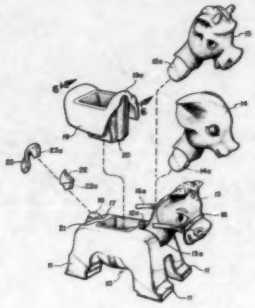
said peeling mechanism is being disposed in opposition to said second roller portion of said transfer roller which cooperates with said second roller portion to nip one end of the copying paper to peel the copying paper from said photosensitive drum, and including a peeling member which is disposed between said second peripheral layer of said photosensitive drum and said second roller portion of said transfer roller and nips one side of the copying paper with the assistance of said second roller portion of said transfer roller, while the one side of the copying paper is not in contact with said second peripheral layer, and a peeling roller rotatably contacting on the second roller portion of the transfer roller, said peeling roller being disposed downstream from said peeling member in a direction of the rotation of said transfer roller and nips with the assistance of said second portion of said transfer roller the one side of the copying paper transferred.

4,373,715
RIDING ANIMAL DEVICE FOR CHILDREN

Billie R. Henn, Box 546, Havre, Mont. 59501

Filed Apr. 1, 1981, Ser. No. 249,817
Int. Cl.³ A63G *19/00*
U.S. Cl. 272—1 R 4 Claims

1. A riding animal device for children, comprising a body part adapted to be firmly supported on a receiving surface and having an outward configuration simulating the body portion of an animal, said body part being provided with a recessed surface defining a narrow, forwardly and upwardly open slot in the forward end thereof for removably receiving a head part, said slot being closed at its lower end; a plurality of independent head parts formed, respectively, to simulate the heads of different animals; correspondingly narrow, substantially flat tongues extending backwardly from the respective head parts for fitting snugly but freely into the said forwardly and upwardly open slot of the body part, the surface of said slot providing the sole support means for each of the tongues when inserted into said slot, each of said tongues when inserted into said slot forming the sole attachment means of the head part associated therewith to the body part to provide for quick and easy changing of the head parts; the opening of said forwardly and upwardly open slot in the body part extending

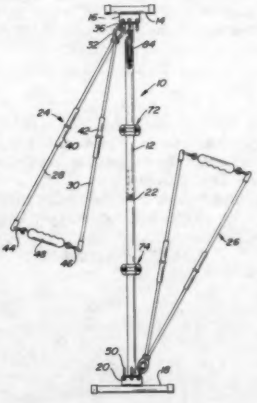


rearwardly a distance such as to provide oscillating leeway for the received tongue of one of said head parts upwardly and rearwardly from the closed lower end thereof which serves as a limit stop for gravity descent of the head part; and bridle and reins associated with each of the head parts for enabling the head part associated with the tongue received in the slot as defined above to be pulled upwardly and rearwardly by a child seated on the animal.

4,373,716
EXERCISING DEVICE

Franco Pagani, 1100 Newportville Rd., Apt. 908, Croydon, Pa. 19020

Filed Dec. 17, 1979, Ser. No. 104,248
Int. Cl.³ A63B *21/04*
U.S. Cl. 272—137 18 Claims



1. An exerciser comprising a rigid central rod, a rigid transverse header fixedly secured to at least one of the end portions of said rod, said header being generally perpendicular to said rod and being substantially shorter than said rod, at least two strands of extensible cord each releasably attached at their end portions to opposite end portions of said rod to thereby define

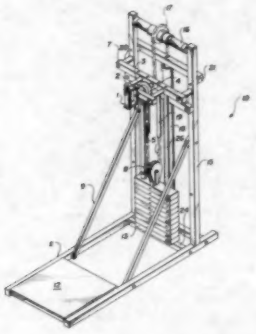
one disposition wherein said strands are generally parallel to said rod, means at a first end portion of said rod for releasably securing both end portions of one strand thereto, and means at the opposite end portion of the rod for releasably securing both ends of the other strand thereto to thereby define a second disposition of said strands relative to said rod.

4,373,717

WRIST CURL MACHINE

Lloyd J. Lambert, Jr., 1538 College Ave., South Houston, Tex. 77587

Filed Nov. 1, 1978, Ser. No. 956,675
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—67 **8 Claims**



1. A wrist curl machine comprising a shaft, a plurality of adjustable weights, a first hand grip means for being grasped by a user and for raising and lowering said plurality of adjustable weights, said first hand grip means being supported on said shaft, an upper first sprocket supported on said shaft so that rotation of said first hand grip means causes rotation of said upper first sprocket, a lower second sprocket, a chain connected to said upper first sprocket and which extends downwardly and around said lower second sprocket, said weights connected to said lower second sprocket, whereby when said hand grip means is rotated to wind the chain on said upper first sprocket, said weights will be displaced upwardly, said weights are constrained by vertical rods so that they are capable of only vertical displacement, said chain extends beyond said lower second sprocket upwardly to a third sprocket, an axle supporting said third sprocket, second hand grip means disposed on said axle on opposed sides of said third sprocket, whereby rotation of said second hand grips means on opposed sides of said third sprocket causes vertical displacement of said weights as well.

4,373,718

FLEXIBLE CORK HANDLE-WRAPPING STRIP

Donald H. Schmidt, 14745 Major Ave., Oak Forest, Ill. 60452

Continuation-in-part of Ser. No. 167,697, Jul. 11, 1980, abandoned. This application May 26, 1981, Ser. No. 266,748
Int. Cl.³ G05G *1/04*; C08G *51/20*; A63B *49/08, 53/14*
U.S. Cl. 273—75 **21 Claims**

1. An elongated, flexible handle-wrapping strip which comprises a first layer of a composite of cork granules, each 40 parts by weight of said cork granules being plasticized with 3 to 20 parts by weight of a liquid organic polyol and bonded together in a flexible plastic binder material; a second layer of adhesive on one side of the first layer, said adhesive layer comprising a flexible plastic sheet coated on both sides with said adhesive and bonded on one side to said first layer; and a

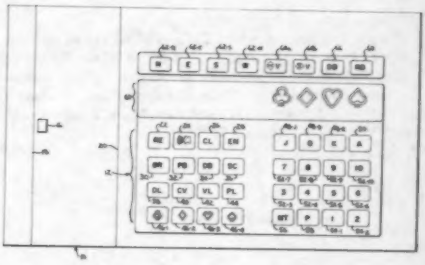
third, peel-sheet layer overlying the adhesive layer for peeling away to expose the adhesive layer for use.

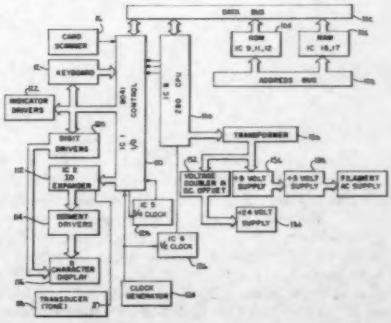
4,373,719

ELECTRONIC BRIDGE GAME SYSTEM

Ronald C. Nelson, and Richard L. Merrick, Jr., both of Miami, Fla., assignors to Fidelity Electronics, Ltd., Miami, Fla.

Filed Jan. 4, 1980, Ser. No. 109,495
Int. Cl.³ A63F *1/00*
U.S. Cl. 273—1 E **13 Claims**





1. An electronic game playing system for performing in the place of at least one of the plurality of human players which

normally play bridge card games selected functions normally performed by one or more of the players comprising:

memory means for storing data required for the play of the game including data representative of the identity of cards to be played by the system, data representative of cards played by the players and the system, data representative of each bid in a sequence of a plurality of bids made by the player and the system, and including data received by system data input means;

system data input means including card input means for receiving selected card identity data and bid input means for receiving bid data representative of each of a sequence of bids by the players;

means for producing positional identity data representative of the relative position of each of the card hands;

bid response means for selecting a sequence of one or more bid values for each of the card hands being played by the system in response to the card identity data for each such hand and in response to each prior bid in the sequence of said bid data stored in said memory means in accordance with preselected criteria stored in memory;

contract value memory means responsive to a selected sequence of bids for storing data representative of the last bid prior to said selected sequence and for storing the positional identity data representative of the card hand making said last bid;

card playing means for selecting data representative of a card from the cards in each of the card hand being played by the system in response to the identity of cards played by the human players, the identity of cards in the hand being played by the system and the value stored in said contract value memory means in accordance with preselected playing criteria; and

display means for displaying the bid values selected by the system and the identity of the each card selected by the system.

4,373,720

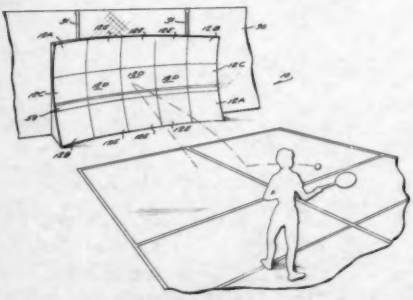
TENNIS PRACTICE BACKBOARD

John P. Lombardi, Sterling, Va.; Tore M. Hult, Bethesda, Md., and Robert H. Trowbridge, Jr., Leesburg, Va., assignors to Jimmy Connors Rally Champion Enterprise, Sterling, Va.

Filed Aug. 6, 1980, Ser. No. 175,743

Int. Cl.³ A63B *61/00, 69/38*

U.S. Cl. 273—29 A **9 Claims**



1. A tennis practice backboard comprising

a plurality of rebound panels, each having a rebound surface curved about a first axis, wherein each of said panels consists essentially of an integral structure of self-skinning structural polyurethane foam having a density of about 4–80 lbs./ft.^{3}, a skin density of about 20–80 lbs./ft.^{3}, and a skin hardness of about 30–90 on the Shore D scale and 50 to 95 on the Shore A scale, and wherein each of said panels has an integral circumferential lip extending away from said concave surface thereof;

means for attaching said panels together in abutting relationship to provide a tennis rebound backboard curved about a common said first axis;

means for attaching each of a plurality of brackets to a said panel;

wherein said means for attaching said panels together comprise a plurality of fasteners passing through adjacent lips of adjacent panels, and passing through adjacent lips and brackets; and

means for mounting said tennis rebound backboard so that said first axis is horizontal and so that the top of said backboard is tilted backwardly with respect to the bottom thereof a small positive angle α.

4,373,721

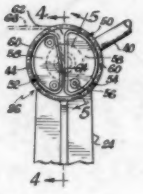
RACKET STRINGER TENSIONER

Lynn L. Ray, P.O. Box 3464, San Diego, Calif. 92103

Filed Feb. 27, 1981, Ser. No. 238,890

Int. Cl.³ A63B *51/00*

U.S. Cl. 273—73 A **3 Claims**



1. In a racket stringer having a frame for holding a racket and a string tensioner support mounted to said frame, a string tensioner comprising:

(a) a split drum and means mounting same to said support rotationally to define a rotational axis generally perpendicular to the direction of a string extended from said racket;

(b) said split drum defining two drum portions having a corridor therebetween and being mutually compressible under the action of a string wrapped therearound to pinch a string extended through said corridor;

(c) said drum being substantially circular in cross-section and said corridor generally following a chord across a cross-section of said drum;

(d) a member mounted to said support for releasably applying a rotational force to said drum mounting means about its axis such that a string drawn from a racket around said drum and through said corridor is gripped by said drum portions and tensioned by the force exerted by said member; and

(e) said means mounting said drum portions comprising a carrier rotationally mounted to said support, and one of said drum portions being fixed on said carrier and the other being moveably mounted thereto to be compressible against the drum portion fixed on said carrier to pinch a string extended through said corridor.

4,373,722

ELECTRONIC VEHICLE RACE SIMULATOR

Kenneth M. Kite; Allen F. Eberts, both of Cincinnati, and Joseph A. Cocovich, Loveland, all of Ohio, assignors to CPG Products Corp., Minneapolis, Minn.

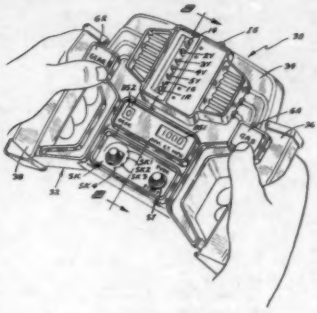
Filed Jun. 12, 1980, Ser. No. 158,835

Int. Cl.³ A63F *9/14*

U.S. Cl. 273—85 G **35 Claims**

1. An electronic vehicle race simulator comprising sound producing means, means providing a relatively low frequency signal, means responsive to said signal for causing said sound producing means to provide a sound resembling the sound of a vehicle engine at a given speed, display means responsive to said

signal for providing a numerical reading representative of engine speed at any given moment, manually-actuatable means, means controlled by said manually-actuatable means for increasing the frequency of said signal in accordance with the length of time said manually-actuatable means is actuated to cause said sound producing means to provide a higher pitch sound resembling a higher engine speed and to cause said



display means to simultaneously provide a higher numerical reading representative of the higher engine speed, means for selecting a predetermined value of said frequency, means for detecting when said predetermined frequency value has been exceeded, and means responsive to said detecting means for interrupting the production of sound from said sound producing means after said frequency has increased to said predetermined value.

4,373,723

AMUSEMENT APPARATUS

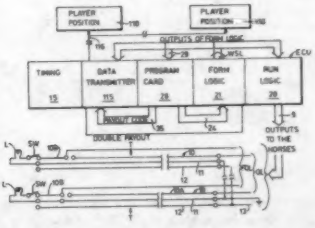
George E. R. Brown, 42 Rimington Way, Osgodby, Scarborough, North Yorkshire, England (YO11 3QN); Arthur E. Helm, 32 Beresford Dr., Churchtown, Southport, Merseyside, and Stuart Keane, Dove Cottage, 15, Garden La., Sherburn in Elmet, Yorks, both of England

Filed Sep. 19, 1980, Ser. No. 189,968

Claims priority, application United Kingdom, Sep. 22, 1979, 7932929

Int. Cl.³ A63F *9/14*

U.S. Cl. 273—86 B **23 Claims**



23. Amusement apparatus including means for controlling the movement of a plurality of objects simultaneously over a course having a first part and a last part in each of successive games, means for establishing probabilities for each object to complete the course first in any game, the means for controlling being responsive to the means for establishing and to means for ensuring that the first object to complete the course and thus win is not predictable, and means for generating data representative of the winning object, and payout in accordance with its odds; a plurality of player stations each including means for displaying said odds for the objects and for the first object to complete the course in any game, means for entering a choice by a player of which of the objects he thinks may win, means for accepting choice tokens representing a bet stake on that choice, and means for paying out tokens in accordance with said odds in the event of the chosen object winning, and data transmission means for sending data from the means for generating to means at each player station for receiving said data and controlling operation of the means for paying out.

4,373,724

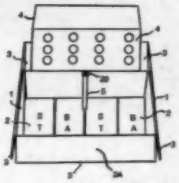
FAMILY BASEBALL GAME

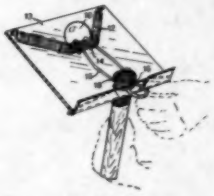
Harry Shoglow, 4200 Lee Hwy., Arlington, Va. 22207

Filed Aug. 4, 1980, Ser. No. 174,934

Int. Cl.³ A63F *7/06, 7/24, 7/30*; A63B *63/04*

U.S. Cl. 273—89 **1 Claim**





1. A packaged baseball game comprising a container having sides and a bottom

a flap securred to each side movable between a container closing position and a container opening position,

a target securred to one of said flaps on the side thereof facing said bottom when said flap is in its container closing position,

said target comprising a plurality of scoring apertures therein, and baseball scoring indicia adjacent said apertures,

a prop means engagable with said target for holding said target in an upright position with said apertures facing outwardly overlooking said bottom,

said bottom comprising a plurality of troughs and further baseball scoring indicia in said troughs, and

an ejector for propelling balls toward said target comprising, a flat disc, a spring securred at opposite ends to spaced points on said disc, a handle securred to said disc for manipulating and aiming said ejector and a wire securred to said spring intermediate said ends for retracting said spring.

4,373,725

PINBALL MACHINE HAVING MAGNETIC BALL CONTROL

Steven S. Ritchie, Carpentersville, Ill., assignor to Williams Electronics, Inc., Chicago, Ill.

Filed Oct. 24, 1980, Ser. No. 200,559

Int. Cl.³ A63D *3/00*

U.S. Cl. 273—121 A **11 Claims**

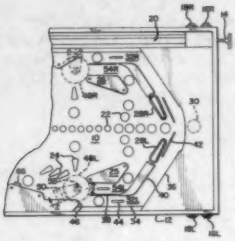
1. An improved pinball machine including an inclined play-

field having targets, balls susceptible to magnetic attraction, and a means for propelling said balls into play upon said playfield, the improvement comprising:

(a) an electromagnet operatively associated with said playfield;

(b) a first switch external of said playfield which can be activated by a player;

(c) a second switch which is actuated by a ball operating one or more targets on said playfield; and



(d) said electromagnet, said first switch, and said second switch connected in circuit so that a ball which hits said target thereby activating said second switch may thereafter be selectively attracted by said electromagnet upon activation of said first switch by the player thereby to alter or stop the motion of such ball.

4,373,726

AUTOMATIC GAMING SYSTEM

Richard W. Churchill, Hopkinton; Don W. Hartman, Harvard; Richard A. Howard, Stow, all of Mass., and Victor Markowicz, North Bergen, N.J., assignors to Datatrol Inc., Hudson, Mass.

Filed Aug. 25, 1980, Ser. No. 180,603
Int. Cl.³ A63F 7/00
U.S. Cl. 273—138 A **10 Claims**

1. An automatic gaming system employing a plurality of gaming cards used by the players comprising:

a card dispensing unit including means for reading from a gaming card a coded representation of the gaming indicia format on the card;

storage means;

means for verifying the coded representation;

means responsive to a verified coded representation for assigning a control identification to that card and storing said coded representation and control identification in said storage means;

means for printing said assigned control identification on said card; and

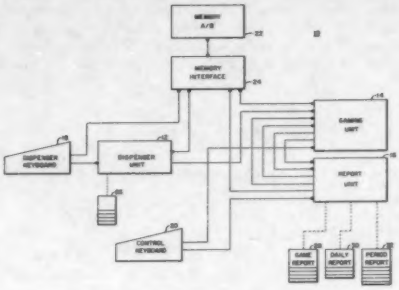
a gaming unit including means for entering selected gaming indicia in said storage means;

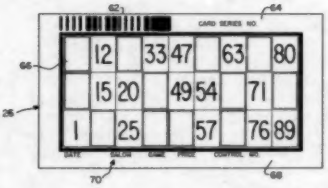
means for entering the control identification of an alleged winning card;

means for validating said control identification of the alleged winning card;

means for comparing the entered selected gaming indicia with the gaming indicia format of the alleged winning card to determine if a predetermined pattern of the selected indicia is present on the card format indicating a winning card;

means for setting the value of the cards and means for selecting the number of cards to be printed and storing that information in said storge means; and





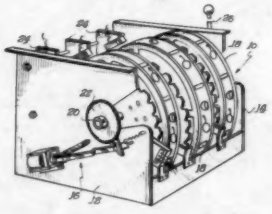
means for calculating the value of all cards printed and the award for a winning card.

4,373,727

VARIABLE SPEED GAMING DEVICE

Donald E. Hooker, Wilmette, and Roman A. Tojza, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Apr. 3, 1980, Ser. No. 136,818
Int. Cl.³ A63F 5/04
U.S. Cl. 273—143 R **13 Claims**



1. Apparatus for rotating the reels of a slot machine at a speed that is directly proportional to the speed in which the operating handle is pulled through its forward stroke and for stopping the reels after a period of rotation wherein the period of rotation of each reel is inversely proportional to the speed with which the handle is pulled through its forward stroke, comprising:

means for detecting the speed of forward movement of said operating handle and for generating electrical signals whose value varies in proportion to the detected speed;

means for driving said reels in response to said electrical signals, said driving means initially rotating said reels at a speed that varies in proportion to the value of said electrical signals; and

means for stopping each of the reels in response to the value

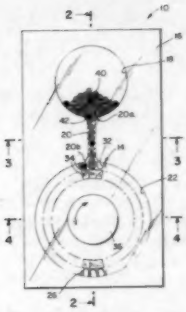
of said electrical signals, the period of rotation of said reels varying in accordance with the value of said electrical signals.

4,373,728

APPARATUS FOR RANDOM NUMBER SELECTION

Willi Korzenietz, 18-06 Parsons Blvd., Whitestone, N.Y. 11357

Filed Oct. 19, 1981, Ser. No. 312,644
Int. Cl.³ A63F 5/02
U.S. Cl. 273—144 B **3 Claims**



1. Apparatus for dual random number selection which comprises:

(a) a base having a mixing reservoir, a well having a central aperture and a conduit between said mixing chamber and said well;

(b) a plurality of colored filler balls stationed in said mixing reservoir in said base;

(c) a plurality of different colored winning balls stationed in said mixing reservoir in said base;

(d) a wheel assembly having a wheel with a plurality of receptacles on its circumference each of which are randomly numbered on the top surface of said wheel, a lower shaft affixed to the bottom central surface of said wheel that mates with said central aperture in said well of said base whereby said receptacles are level with said conduit of said base and an upper shaft affixed to the top central surface of said wheel;

(e) a transparent cover affixed to said base having an aperture that allows said upper shaft of said wheel assembly to extend above top surface of said cover; and

(f) a knob having an aperture in the bottom surface that mates with said upper shaft of said wheel assembly whereby said wheel is free to rotate clockwise or counterclockwise between said base and said cover so each said receptacle is able to receive one said filler ball or said winning ball that travels from said mixing chamber into said conduit in said base when said apparatus is placed in a vertical position.

4,373,729

PUZZLE WITH ROTATABLE BLOCKS AND FACE PORTIONS SLIDABLE THEREBETWEEN

Steven P. Hanson, Rancho Palos Verdes, Calif., and Jeffrey D. Breslow, Highland Park, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

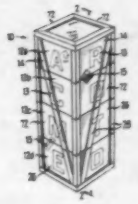
Filed Jan. 12, 1981, Ser. No. 224,466
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **10 Claims**

1. A game device comprising:

a plurality of blocks each having a plurality of sides and a pair of opposed ends, at least two of said blocks being rotatable with respect to a third block, said blocks being connected together in a columnar array with their ends in abutment, for relative rotation around a common axis;

a plurality of face portions slidably retained on the sides of said blocks for sliding movement from one block to another in a direction generally parallel to said common axis, the number of face portions being one less than the number of block sides, to permit movement of said face portions parallel to said common axis from one block to another;

means for preventing sliding movement of said face portions around said common axis, with respect to the block upon which said face portions are mounted; and



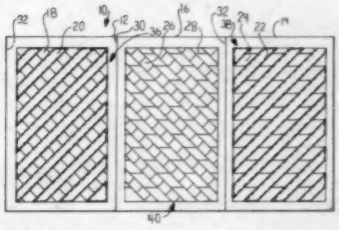
indicia means on each of said face portions for distinguishing said face portions from one another and defining a predetermined arrangement of said face portions on said device in order to implement a game wherein a player attempts to arrange the face portions in the desired arrangement by rotating said blocks with respect to one another and sliding said face portions from one block to another.

4,373,730

MULTI PANEL VISUAL DEVICE

Irving M. Koltz, 1329 Steeles Ave W. TH #4, Willowdale, Ontario, Canada (M2R3N2)

Filed Nov. 17, 1980, Ser. No. 207,393
Int. Cl.³ A63F 9/08
U.S. Cl. 273—155 **15 Claims**



1. A novelty or educational device comprising in combination:

(a) a first panel, said first panel having a first group of illustration segments in a predetermined pattern,

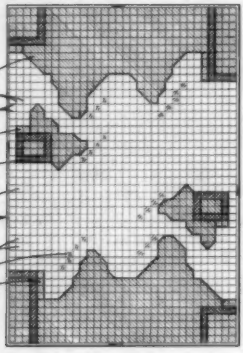
(b) at least one overlay panel contiguous with said first panel and separated therefrom by a fold line, said overlay panel having a plurality of window areas arranged in a pattern corresponding to said predetermined pattern, and a second group of illustration segments on non-window areas, said second group of illustration segments being the complement of said first group of illustration segments,

and wherein said window areas being in a complex pattern alternating from window to solid area in both the horizontal and vertical directions whereby the illustrations of said illustration segments are obfuscated,

and wherein both the reverse and the obverse of each panel contains illustrations segments which are the compliment

of illustration segments of other panels, thereby providing at least a second illustration.

4,373,731
BOARD GAME
Dennis J. C. Whiteman, 122 Maude St., Geelong, Victoria, and Gary R. C. Whiteman, 122 Maude St., Gellong, Victoria, both of Australia
Filed Apr. 14, 1980, Ser. No. 140,389
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—262 **10 Claims**



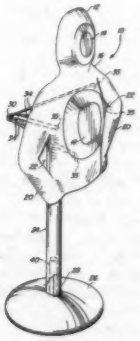
1. A war game combining elements of skill and chance including:
- a playing board having a grid pattern thereon made of contiguous segments, said playing board being divided into land areas having land indicia thereon comprising at least one grid segment called a land segment, and sea areas having sea indicia thereon comprising at least one grid segment called a sea segment;
- a plurality of sets of playing pieces adapted for movement within prescribed areas;
- a random number generator;
- at least one fort area on said playing board comprised of a plurality of contiguous segments surrounded by either contiguous fort perimeter segments having fort perimeter indicia thereon or surrounded by a combination of contiguous fort perimeter segments and the border of said board; and
- a plurality of removable fort block means, one fort block means placed on each said fort perimeter segment, capable of being removed therefrom, for allowing entry into said fort areas by at least one type of playing piece when at least one fort block means is removed.

4,373,732
TRAVEL GAME
Jim W. Ogilvie, 524 Wolfberry Rd., Richmond, Va. 23235
Filed Jun. 29, 1979, Ser. No. 53,622
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—271 **7 Claims**

1. A method of playing a game with polyhedron-shaped blocks having indicia on a plurality of sides of each of said blocks representing a scene commonly viewed along a route of travel, said method employing the following steps:
- observing scenes along a route of travel corresponding to scenes represented by indicia on sides of said blocks;
- arranging said blocks in rows and columns, with each of said arranged blocks displaying one side thereof prominently;
- orienting said blocks in said rows and columns to have particular predetermined orientations upon players observing scenes represented by the indicia on the sides of said respective blocks;

whereby, said players orient said blocks until they achieve a pre-set orientation pattern or until a time or distance limit is reached.

4,373,733
REACTIONARY HUMAN SILHOUETTE TARGET
Marvin F. Smith, Jr., P.O. Box 832, Willcox, Ariz. 85643
Filed May 13, 1981, Ser. No. 263,151
Int. Cl.³ F41J *5/00, 5/06*
U.S. Cl. 273—381 **7 Claims**



1. A target for shooters which gives specific indication of where struck when struck at different locations by a bullet comprising a defined silhouette type target of a durable material, a stand resting on the ground, and pivotal means interposed between said silhouette type target and said stand, said pivotal means attached to said silhouette type target generally in the central area thereof, said pivotal means adapted to permit deflection by said silhouette type target to either side, top, or bottom in response to a hit remote from said central area, and said pivotal means also adapted to permit the silhouette type target to move in a straight line away from and upward from the shooter in response to a hit in said central area, whereby said pivotal means permits the target when struck, to deflect or move indicative of where struck, including the central area, the target being responsive at the location where struck with movement carrying through the momentum transferred by the striking bullet.

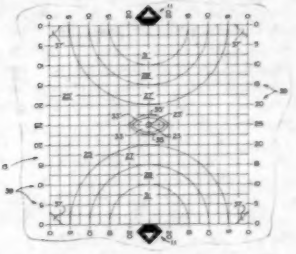
4,373,734
DISK THROWING GAME
Charles E. Frank, 1759 Chancery #3, Memphis, Tenn. 38116
Filed Jun. 1, 1981, Ser. No. 269,327
Int. Cl.³ A63B *67/06, 63/00*
U.S. Cl. 273—411 **11 Claims**

1. A game which involves first and second opposing teams

attempting to score points by throwing a flying disk in a desired manner, said game comprising:

(a) goal means for selectively receiving a flying disk thrown by one of the members of the first or second opposing teams, said goal means including a hollow body member having at least one opening therein of a shape which allows the flying disk to enter the interior of said body member therethrough; and

(b) playing field means positioned adjacent said goal means for controlling the action of the first and second opposing teams during the playing of said game, said playing field means including a serving area for allowing one member of one of the first or second opposing teams to introduce a flying disk into said game by throwing the disk to another member of the first or second opposing teams, said playing field means including a player interaction area



adjacent said serving area for allowing one of the members of the first or second opposing teams to catch the disk as the disk is thrown from said serving area and for allowing the members of the first and second opposing teams to interact with one another in a manner in which one of the opposing teams attempts to move the disk toward said goal means while the other of the opposing teams attempts to prevent the disk from being moved toward said goal means, said playing field means including a shooting area adjacent said player interaction area for allowing one of the members of the first or second opposing teams to throw the disk at said opening in said body member of said goal means, said playing field means including a shot-blocking area intermediate said shooting area and said goal means for allowing the members of one of the first or second opposing teams to block the throw of the disk from said shooting area to said goal means.

4,373,735

SOFT MATERIAL SEALING DISC USED AS HEAD GASKET

Martin Morsbach; Friedhelm Stecher, both of Burscheid, and Eberhard Stöcker, Herdorf, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

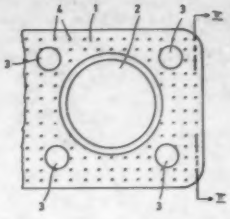
Filed Sep. 17, 1979, Ser. No. 76,210

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840154

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—235 B **13 Claims**

1. A porous soft material sealing gasket, comprising a soft material in the form of an asbestos fiber web having a sealing face and an impregnating agent, said asbestos fiber web containing free pores and a multiplicity of perforations in its unimpregnated form, and said impregnating agent filling at least a



part of the free pores of the web by penetrating through the perforations during impregnation.

4,373,736

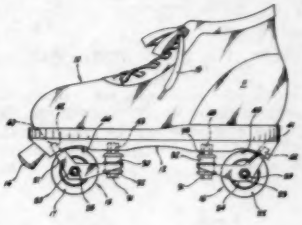
TWO WHEEL ROLLER SKATE

Leo F. Stumbaugh, 6780 SE. 125th St., Box 24, Belleview, Fla. 32620

Filed Dec. 22, 1980, Ser. No. 219,267

Int. Cl.³ A63C *17/02*

U.S. Cl. 280—11.23 **2 Claims**



1. A two wheel roller skate, comprising:

(a) a shoe,

(b) a sole attached to the shoe,

(c) front and rear wheel assemblies, each assembly including a wheel, an axle carrying the wheel and an axle fork carrying the axle, the axle fork including:

1. opposed side portions receiving an associated axle in bearing relation, and having first interconnected ends and second unconnected ends, and

2. fastener means selectively operatively attaching said interconnected ends to said sole, the unconnected ends being received by said sole in bearing relation,

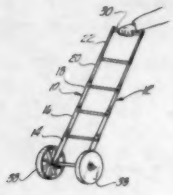
(d) the sole including front and rear pairs of opposed side slots which receive the side portion unconnected ends in bearing relation, the side portion unconnected ends and fastener means providing a three-point connection to the sole, and

(e) said side portion unconnected ends including portions received by the sole slots and bearing margins directly engaging the bottom surface of the sole.

4,373,737
GAME CARRIER

Thomas R. Cory, 2354 Tecumseh, Brooklyn, Mich. 49230; Lyman R. Cory, 13861 Vischer, Brooklyn, Mich. 48230, and Edward P. Maloney, 22170 W. Nine Mile, Southfield, Mich. 48034

Filed Oct. 22, 1980, Ser. No. 199,470
Int. Cl.³ B62B *1/04*
U.S. Cl. 280—30 **4 Claims**

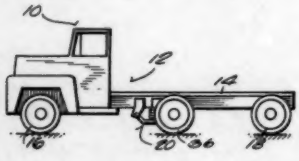


1. A game carrier comprising:
- a pair of extendable rail members, each rail member being movable between a contracted position and an extended position,
- means for selectively locking each rail member in its extended position,
- at least two cross supports attached in a spaced apart relationship transversely between said rail members when said rail members are in their extended position,
- a wheel detachably rotatably mounted to one end of each rail member, said wheels being axially aligned with each other, and
- wherein each wheel further comprises a circular side wall and an annular rim extending axially outwardly from one side of the outer periphery of the side wall, and means for detachably locking the free edge of the wheel rims together thus forming a storage chamber therebetween.

4,373,738
STEERABLE AUXILIARY WHEEL ASSEMBLY FOR VEHICLES

Dennis M. Lange, 3016 S. Sylvania Ave., Sturtevant, Wis.

Continuation-in-part of Ser. No. 144,182, Apr. 28, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,933
Int. Cl.³ B62D *13/00*
U.S. Cl. 280—81.5 **9 Claims**

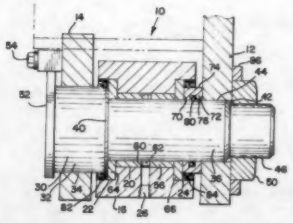


8. An auxiliary wheel assembly for a vehicle including a frame which has a pair of longitudinal frame members including a bottom edge and is supported by a pair of steerable front wheels interconnected by a tie rod and rear drive wheels, said assembly comprising
- a transverse axle member extending below the vehicle frame members and having a generally U-shape with a central portion extending outwardly beyond the vehicle frame members and having opposie outer end portions upwardly offset from said central portion;
- a king pin assembly on each of the outer end portions of said axle member;
- an auxiliary wheel rotatably mounted on each of said king pin assemblies for steering movement;
- a tie rod interconnecting said auxiliary wheels so they steer together;
- a pair of laterally-spaced, generally longitudinally extending arm, each having one end carrying said axle member and the other end mounted on a vehicle frame member for pivotal movement of said axle member about an axis located below the bottom edges of the vehicle frame members between an operating position wherein said auxiliary wheels are in engagement with the ground and a retracted position wherein said auxiliary wheels are raised above the ground and said central portion of said axle member is retracted to position immediately adjacent the bottom edges of the vehicle frame members and the rotational axes of said auxiliary wheels are located above the bottom edges of the vehicle frame members;
- actuation means for moving said axle member between the operating and retracted positions, said actuation means including means connected between the vehicle frame member and said arms for biasing said axle member toward the retracted position, an inflatable air spring disposed between the bottom edge of each vehicle frame member and each of said arms at a location between said axle member and the pivot axis of said arm, and means for selectively pressurizing said air spring to move said axle member from the retracted position to the operating position against the biasing force of said biasing means and for selectively depressurizing said air springs to permit said biasing means to return said axle member from the operating position to the retracted position;
- a slave cylinder filled with an actuating fluid and housing a piston carried on an externally extending piston rod connected to said front wheel tie rod for reciprocative movement in response to steering movement of said front wheels;
- a drive cylinder filled with said actuating fluid and housing a piston carried on an externally extending piston rod connected to said auxiliary wheels to steer said auxiliary wheels in response to reciprocative movement of said drive cylinder piston; and
- conduit means filled with said actuating fluid and interconnecting said slave and drive cylinders in fluid communication such that reciprocative movement of said slave cylinder piston causes reciprocative movement of said drive cylinder piston.

4,373,739
AXLE BOLSTER PIVOT ASSEMBLY

John E. Klem, Waukegan, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Jun. 27, 1980, Ser. No. 163,611
Int. Cl.³ B60G *5/00*
U.S. Cl. 280—111 **10 Claims**



1. In an off-highway four wheel drive articulated loader having a main transverse frame and a rear axle bolster pivotally mounted to said main frame providing a rear axle suspension, the improvement comprising:
- a rear axle bolster frame having a bore therethrough aligned with a transverse centerline of said main frame, said

through bore provided with an inboard counterbore and an outboard counterbore;

a pivot pin disposed in fixed position in aligned bores of a forward wall and a rear wall of said main frame, said pivot pin having a first and a second diameter portion, said first diameter portion being larger than said second diameter portion and providing a shoulder between said first and second diameter portions, said first diameter portion being disposed in said bore of said rear wall and said second diameter portion being positioned in said through bore of said rear axle bolster, said second diameter portion also extending through said bore of said forward wall of said main frame;

a bushing located in said through bore of said bolster frame between said bolster frame through bore and said second diameter portion of said pivot pin;

an inboard thrust bushing and an outboard thrust bushing located respectively in the inboard and outboard counterbores of said bolster frame through bore;

a spacing member carried on said second diameter portion of said pivot pin between said outboard thrust bushing and said main frame forward wall, said spacing member having an outside diameter the same as said first diameter portion of said pin; and

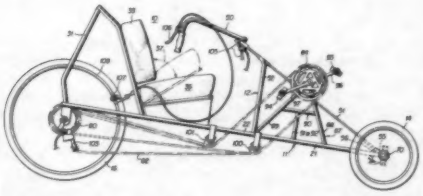
a pair of identical wiper seals, a first of said pair carried on said first diameter portion of said pivot pin in contact with said inboard counterbore and a second of said pair of wiper seals carried on said spacing member in contact with said outboard counter bore.

4,373,740

THREE-WHEEL VEHICLE

Willie J. Hendrix, 23 W. Broadway, Central Nyack, N.Y. 10960

Filed Oct. 31, 1980, Ser. No. 202,623
Int. Cl.³ B60K *5/06, 5/08*
U.S. Cl. 280—269 **6 Claims**



1. A three-wheel velocipede with a rear driving wheel driven by a sprocket and a pair of front steering wheels, the velocipede comprising:

a frame having a base for supporting the wheels and a superstructure for supporting a crank with a sprocket for driving a chain which is trained around the rear wheel sprocket, steering gear with a steering column, and a seat with a back rest, the seat resting on top of the base; said base having a pair of side rails which converge from the front end of the velocipede toward a middle section thereof and diverge from the middle section to the rear end of the vehicle, said side rails forming a fork for supporting the axle of the rear wheel between the rails, said base further including a plurality of bracing tubes a first of which extends between the side rails at the front end thereof, a second of which extends between the side rails intermediate the front end and middle section, and a third which extends between the side rails just forward of the rear wheel;

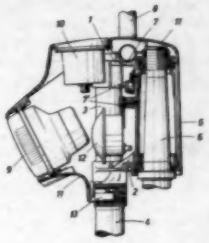
said superstructure including a single, inverted, V-shaped stanchion for supporting the crank, the stanchion having one leg connected to the second tube and the other leg to the middle section of the frame; a pair of inverted U-shaped supports for supporting the back rest of the seat each support having one leg connected to the frame adjacent the third brace and the other leg connected at the rear end of the base; and a second stanchion projecting upwardly from the middle section of the base for journaling the steering column therein.

4,373,741

FRONT FORK AND FORK HEAD FOR MOTORCYCLES

Peter Resele, and Manfred Haslinger, both of Graz, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Apr. 28, 1980, Ser. No. 144,416
Claims priority, application Austria, May 16, 1979, 3613/79
Int. Cl.³ B62K *21/02*
U.S. Cl. 280—279 **1 Claim**



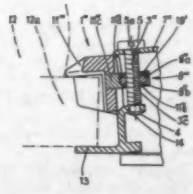
1. In a fork for motorcycles, comprising two fork blades; a fork head comprising a body integrally formed with two sockets, an upper and lower cross-piece connecting said sprockets, two laterally open shell sections adjacent the lower cross-piece, the shell sections being aligned with respective ones of said sockets and being in conforming engagement with part of the periphery of respective ones of said fork blades, each of said fork blades fitting in one of said sockets; a clamp member secured to each of said shell sections and in conforming engagement with another part of the periphery of respective ones of said fork blades; and tangentially extending screws securing each clamp member to a respective one of said shell sections and tightened to force the clamp members against the fork blades.

4,373,742

SKI BINDING PART

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Division of Ser. No. 957,089, Nov. 2, 1978, Pat. No. 4,299,404.
This application Mar. 26, 1981, Ser. No. 247,692
Claims priority, application Austria, Mar. 3, 1978, 1546/78
Int. Cl.³ A63C *9/24*
U.S. Cl. 280—633 **8 Claims**



1. A ski binding part for use in holding a ski boot onto a ski, comprising:

a frame supported on said ski;

a sole holder adapted to engage the upper surface of the sole of said ski boot and having an opening therethrough;

a threaded bolt rotationally supported on said frame, extending through said opening in said sole holder and having a

diameter less than the smallest cross-sectional dimension of said opening;

a coupling part having an internally threaded opening therein threadedly engaging said bolt, disposed within said opening in said sole holder, and having a first friction surface thereon; and

coupling means provided on said sole holder including a second friction surface cooperable with said first friction surface on said coupling part for preventing relative axial movement between and for rotationally frictionally slip coupling said coupling part and said sole holder;

whereby said sole holder and coupling part move axially along said bolt in response to rotation of said bolt until said sole holder engages said upper surface of said ski boot sole, whereupon continued axial movement of said sole holder and said coupling part in response to continued rotation of said bolt will be resisted by said ski boot sole and said coupling part will rotate relative to said sole holder to thereby control the force exerted by said sole holder on said upper surface of said ski boot sole.

4,373,743

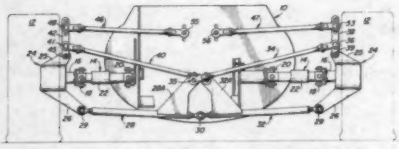
WHEEL SUSPENSION SYSTEM FOR VEHICLES

Charles F. Parsons, Jr., 1760 Plymouth Ct., Wheaton, Ill. 60187

Filed Nov. 21, 1980, Ser. No. 208,855

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 **6 Claims**



1. A wheel suspension system for a vehicle having a frame, comprising in combination,

first and second wheel supports located on opposite sides of said frame and each having wheel mounting axle means thereon,

two pairs of upper and lower links respectively having one outer end of said lower links pivotably attached to a lower portion of one of said wheel supports, and having the other ends of said lower links pivotably attached to said frame for pivotal movement relative to a fore and aft axis,

the inner ends of said upper links being pivotably connected to a respective one of said lower links,

first and second levers respectively and pivotably attached to an upper portion of one of said wheel supports,

the outer ends of said upper links being respectively and pivotably attached to said levers, and

first and second camber control links each pivotably attached at one end to said frame for pivotal movement about a fore and aft axis and pivotably attached at the other end to one of said levers.

4,373,744

SUSPENSION CONTROL SYSTEM FOR A ROAD VEHICLE

Stanley G. Glaze, Brierley Hill, England, assignor to Lucas Industries Limited, Birmingham, England

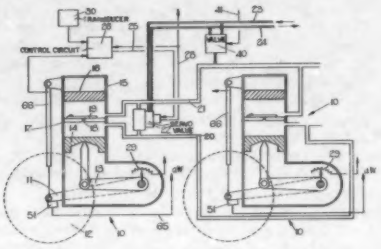
Filed Dec. 31, 1980, Ser. No. 221,707

Claims priority, application United Kingdom, Jan. 23, 1980, 8002317

Int. Cl.³ B60G *11/26*

U.S. Cl. 280—707 **8 Claims**

1. A control system for a hydraulic suspension arrangement on a road vehicle which has a plurality of wheel groups, each said wheel group including one or more wheels each of which has a hydraulic suspension, the suspensions in each said group having a common hydraulic connection, the said control system comprising means for generating first electrical signals corresponding to the vertical accelerations of the respective wheel groups, means responsive to said first electrical signals for generating second electrical signals corresponding to the calculated vertical displacements of the respective wheel groups resulting from said accelerations, means for generating



third electrical signals corresponding to measured vertical displacement of the respective wheel groups, and means, responsive to differences between corresponding ones of said second and third signals, for controlling fluid flow between a source and the hydraulic suspensions of the respective wheel groups.

4,373,745

DASH PANEL CONSTRUCTION

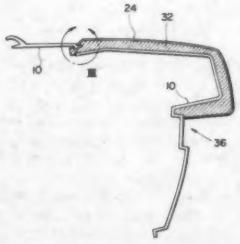
Yoshio Matsuno, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 24, 1980, Ser. No. 190,283

Claims priority, application Japan, Sep. 28, 1979, 54-135499[U]

Int. Cl.³ B60K *37/00*

U.S. Cl. 280—752 **2 Claims**



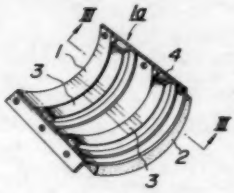
1. A dash panel comprising: a structural panel member having a step like portion, an integral flange on said panel member protruding from said step like portion and cooperating with adjacent surfaces on a first side of said panel member to define a cavity, apertures the step portion of in said panel member opening into said cavity, and an elastomeric pad molded on the first side of said panel member, with the flange on said panel member protruding into said pad and with said pad having integral portions protruding through said apertures to terminate as locking blocks which are engageable with an opposite second side of said panel member.

4,373,746

LEG PROTECTOR FOR PASSENGER IN VEHICLE

Hiroo Okuyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Dec. 11, 1980, Ser. No. 215,255
Claims priority, application Japan, Dec. 12, 1979, 54-172085[U]
Int. Cl.³ B60R 21/00
U.S. Cl. 280—752 5 Claims



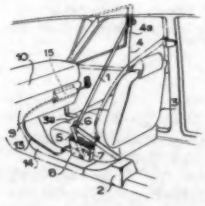
1. A leg protector for a passenger in a vehicle, said protector being made of a panel in the form of a curved body extending toward a seat for the passenger and provided with a pad adhered to a surface facing said seat, said panel further being in the form of a hemicylindrical member whose longitudinal axis is substantially horizontal and comprising at least one closed channel substantially vertically extending along said curved body and filled with an energy absorption material for absorbing kinetic energy from the legs of a passenger upon collision of the vehicle.

4,373,747

PASSIVE SAFETY BELT DEVICE

Junichi Takizawa, Isesaki, and Nobuo Satoh, Ohta, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,178
Claims priority, application Japan, Jul. 17, 1979, 54-98656[U]
Int. Cl.³ B60R 21/10
U.S. Cl. 280—802 5 Claims



1. A passive safety belt device for a vehicle having a door with an inner panel and a knee pad under an instrument panel on a dash-board comprising

a retractor provided in a lower portion of a central portion of the vehicle,

a safety belt connected between said retractor and the door of the vehicle at a rear portion thereof,

a belt guiding member engaged with said safety belt, said belt guiding member being mounted moveable between a backward fastening position near an occupant's waist and a forward releasing position apart from the occupant's waist, and

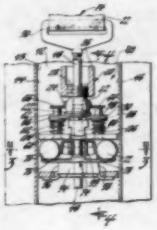
a non-sheathed cable connected between said belt guiding member and said door, said cable passing through said knee pad provided under the instrument panel of the vehicle and projecting from an end portion of said knee pad adjacent to said inner panel of said door and being connected to the inner panel at an outer end of the cable.

4,373,748

SEAT BELT RETRACTING AND LOCKING MECHANISM

Kenneth H. Reid, Mt. Clemens, and Bernard J. Finn, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1980, Ser. No. 201,514
Int. Cl.³ A62B 35/02; B65H 75/48
U.S. Cl. 280—806 3 Claims



1. A restraint belt retracting mechanism comprising:

a tubular housing mounted in vertical orientation on the vehicle body and having a central axial extending passage therethrough defined by an inner wall;

a ramp member carried by the belt and movable axially within the housing during belt extension and retraction, said ramp member having a ramp surface facing the housing inner wall;

a wedge member interposed between the housing inner wall and the ramp member and engaging the ramp surface thereof so that the wedge member is moved radially relative the inner wall upon axial movement relative the ramp member;

spring means urging the wedge member to a normal position spaced away from the inner wall and being yieldable upon occurrence of belt and ramp member acceleration causing movement of the wedge member in the belt extending direction to lag behind the ramp member so that the wedge member is forced radially outward by the ramp surface to forcibly engage the inner wall and lock the ramp member and belt against belt extending movement;

an inertia sensing means responsive to vehicle deceleration and adapted to effect axial movement of the wedge member relative the ramp member and concomitant radial outward movement thereof into engagement with the inner wall to lock the ramp member and restraint belt against belt extending movement.

4,373,749

SEAT BELT RETRACTOR

Hiroyuki Miki, and Hideoki Matsuoka, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 4, 1980, Ser. No. 203,930
Claims priority, application Japan, Nov. 10, 1979, 54-156050[U]
Int. Cl.³ A62B 35/00
U.S. Cl. 280—807 3 Claims

1. For use in an automotive vehicle having a vehicle body floor, a seat belt retractor including:

a retractor casing provided at the approximate center of the vehicle body floor;

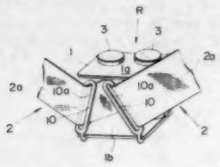
a pair of seat belts adapted to retain two adjacent passengers, each of the seat belts having a webbing;

a pair of winding shafts mounted vertically in the casing for winding the pair of webbings; and

improved guide means for guiding the webbing smoothly

and free of twisting towards and away from the winding shafts, said improved guide means comprising:

a pair of elongate rings each having a slot therein through which a webbing passes in its travel towards and away from a winding shaft, said pair of elongate rings having a pair of guiding portions forming the upper equal sides of



an isosceles triangle for slidably guiding the pair of webbings; and

means in the casing for pivotally supporting the intermediate portion of each elongate ring, each said ring pivoting in response to the forces applied by the sliding webbing and thereby maintaining each webbing smooth and twist-free.

4,373,750

JOINT FOR PIPE INTENDED FOR PETROLEUM INDUSTRY

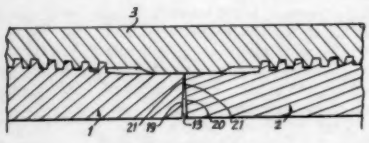
Jean Mantelle, Aulnoye Aymeries, and Georges Trouillet, Aulnoye, both of France, assignors to Societe Anonyme dite: Vallourec, Paris, France

Filed Oct. 28, 1980, Ser. No. 201,472

Claims priority, application France, Oct. 30, 1979, 79 26890

Int. Cl.³ F16L *9/14*

U.S. Cl. 285—55 **11 Claims**



1. A pipe joint structure comprising: externally threaded male members and an internally threaded coupling sleeve, said coupling sleeve threadedly engaging said male members, said sleeve having a substantially cylindrical internal seal surface located between the threads thereon, each of said male members having a thread-free end portion with a substantially cylindrical external seal surface that before make-up has an outer diameter at least equal to the inner diameter of said internal seal surface on said sleeve and which engages said internal seal surface when said joint is made up, said male members having tip regions at the outer peripheries of their said end portions that provide first contact between said end portions as said joint is made up and then tend to move radially outward as said joint is tightened to provide fluid tight sealing engagement of said external seal surfaces with said internal seal surface, said end portions having surface means on the front faces thereof adjacent said tip regions that are shaped to provide a space that increases in size toward the center of said joint prior to make-up and decreases in size during make-up.

4,373,751

EXHAUST ADAPTER FOR EXHAUST GAS MEASUREMENTS

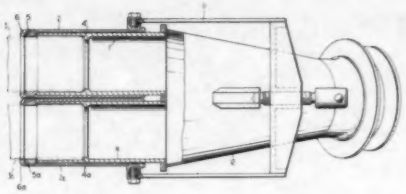
Karl Schober, Weinstadt, and Fritz Groll, Fellbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 15, 1980, Ser. No. 150,097

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921417

Int. Cl.³ F16L *39/00*

U.S. Cl. 285—137 R **4 Claims**



1. An exhaust adapter for enabling exhaust gas measurement, the exhaust adapter being adapted to be attached to an exhaust unit and adapted to be connected to a hose leading to an exhaust gas analyzing measuring system, the exhaust unit includes two tailpipes disposed in a side by side parallel relationship, characterized in that the exhaust adapter includes at least one outer pipe and at least one inner pipe telescopically accommodated therein, the outer and inner pipes are adapted to accommodate at least a portion of the respective tailpipes, a sealing ring is disposed between an end edge of the respective inner pipes and a collar of an associated outer pipe, a funnel shaped member is provided for combining free ends of the two inner pipes, and in that means are provided for restraining each outer pipe with respect to an associated inner pipe and for compressing the respective sealing ring so as to provide for a gastight seal of the adapter on the respective tail pipes comprising a clamping bracket having one end thereof connected to one of the outer pipes and the other end thereof connected to the other outer pipe, and a second means cooperable with the clamping bracket for restraining the respective outer pipes with respect to the associated inner pipes, the second means being adapted to rest on the funnel shaped member when the respective outer pipes are restrained with respect to the associated inner pipes.

4,373,752

WELL CASING HANGER ASSEMBLY

Norman A. Nelson, Houston, Tex., assignor to Samuel Putch, Houston, Tex., a part interest

Continuation of Ser. No. 75,568, Sep. 14, 1979, abandoned. This application Aug. 4, 1981, Ser. No. 289,935

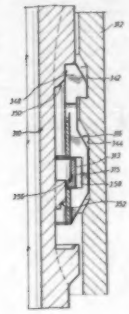
Claims priority, application United Kingdom, Oct. 6, 1978, 39590/78

Int. Cl.³ F16L *21/00*

U.S. Cl. 285—141 **2 Claims**

1. In an assembly for connecting first **310** and second **312** tubular members to and from each other in a well by longitudinal movement of the first member **310** relative to second member **312**, said first member **310** including an annular recess **314** in its peripheral surface and a protrusion intermediate the ends of recess **314**, generally radially extending upper **330** and lower stop shoulders on said first member **310** at respectively the top and bottom of recess **314**, an upper locking shoulder **348** on said first member **310** below and adjacent stop shoulder **330**, a lower locking shoulder **356** on said protrusion of first member **310**, a resiliently expandable and contractable locking means **316** positioned in said recess **314**, said locking means **316** being radially and axially moveable on first member **310** between said upper **330** and lower stop shoulders, an opening **358** in locking

means **316** for receiving said protrusion of first member **310** when locking means **316** is contracted, an upper locking surface and a lower locking surface on said locking means **316** for coacting respectively with said upper locking shoulder **348** and said lower locking shoulder **356** when said locking means **316** is in an expanded position, an upper locking portion **336** on the outer periphery of said locking means **316**, an upper locking notch **342** in said second member **312** for receiving said upper locking portion **336** upon expansion of said locking means **316** in a manner to prevent further downward movement of locking means **316** and to allow upward retraction of locking means **316** from locking notch **342**; the improvement comprising: an



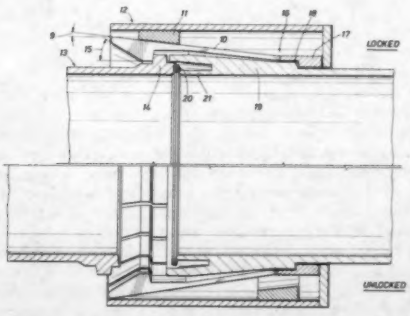
expandable and contractable, circular release spring **313** having a split to form a "C" shape, said release spring **313** positioned about the periphery of said protrusion of first member **310** and within said opening **358** of locking means **316**, said release spring, locking means and protrusion having coacting means thereon for preventing axial movement of locking means **316** relative to first member **310** when locking means **316** is in a contracted position with said protrusion positioned in said opening and for expanding said release spring into said opening allowing said locking means **316** and release spring **313** to move outwardly and upwardly relative to first member **310** upon locking portion **336** encountering locking notch **342**.

4,373,753

SPRING FINGER CONNECTOR

Ray R. Ayers, and Robert M. Kipp, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 18, 1981, Ser. No. 264,317
Int. Cl.³ F16L *37/12*
U.S. Cl. 285—319 **6 Claims**



1. A connector for releasably joining the ends of two pipes together comprising:

a first hub member attached to an end of one of the two pipes and having an outer shoulder and an inner annular recess;

a cantilevered hub member attached to an end of the other of the two pipes and having an outer lip adapted to align and engage with the shoulder of the first hub member and an inner lip having an outer annular recess and a thickness of less than one-half a pipe wall thickness;

a plurality of spring expandable, contactable fingers extending from an annular shoulder and laterally across the outer lip of the cantilevered hub member to a position to be engageable with the outer shoulder of the first hub member, the fingers being adapted to lock the outer shoulder of the first hub member to a shoulder on the pipe end adjacent to the annular shoulder; and,

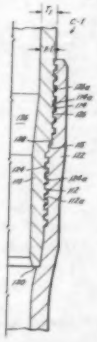
an annular sealing ring adapted to be seated between the inner annular recess of the first hub member and the outer annular recess of the inner lip of the second hub member, the sealing ring being adapted to inwardly deflect the inner lip of the cantilevered hub member and to coact with the inner lip to store elastic strain energy.

4,373,754

THREADED CONNECTOR

Charles A. Bollfrass; Leonard S. Landriault, and Patrick E. McDonald, all of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 932,278, Aug. 9, 1978. This application Jun. 4, 1981, Ser. No. 270,315
Int. Cl.³ F16L *25/00, 21/00*
U.S. Cl. 285—334 **20 Claims**



1. A high tensile strength threaded connection for releasably securing separate members by rotational make-up of a threaded male member with a threaded female member along a common longitudinal axis to form the connection, including:

a male member having an external helical thread means formed thereon, said external thread means having a negative angled loading flank relative to the longitudinal axis of the threaded connection;

a female member forming a longitudinal axis and having an internal helical thread means formed thereon, said

a female member having an internal helical thread means formed thereon, said internal thread means also having a negative angled loading flank for engaging said negative angled loading flank of said external thread means formed on said male member;

a first make-up limiting means formed on said male member;

a second make-up limiting means formed on said female member for engagement with said first make-up limiting means formed on said male member for limiting rotational make-up of said helical thread means;

a portion of external thread means having a loading flank of a smaller loading area than the remainder of said external

thread means loading flank to minimize the critical reduction of thickness of said male member; and

said female member having at least a portion thereof of reduced strength relative to the remainder of said female member located adjacent said smaller loading area loading flank of said female member to insure a more uniform distribution of the loading on the negative angled smaller area loading flanks wherein the tensile loading on the thread loading flank is distributed on said male and female members to enhance tensile strength of the threaded connection.

4,373,755

LIFTING DEVICE FOR THE TRANSPORTATION OF FLASKS

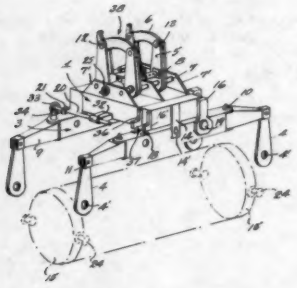
Klaus Herberholz, Taunusstrasse 31, 6457 Maintal 2, and Peter Schmidt, Huhnerberg 1, 6466 Grundau, both of Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,196

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943523

Int. Cl.³ B66C *1/10*

U.S. Cl. 294—67 R **9 Claims**



1. A lifting device for transporting flasks in a horizontal position, said flasks being provided at their ends with pairs of laterally projecting trunnions, particularly transportation flasks for radioactive materials in industrial nuclear plants, comprising:

a torsion body;

crane hook attachment structure on said body;

two cross pieces, one on each end of said body, one of said cross pieces being fixedly connected with said torsion body and the other being suspended from said body for tilting movement about a horizontal axis transverse of said other cross piece;

means for limiting such tilting movement relative to said body; and

lug side arms detachably engageable with flask trunnions, one hanging from and mounted to each end of said cross pieces for lateral adjustment relative thereto.

4,373,756

WHEELCHAIR TRAY ASSEMBLY

Geoffrey H. Purdy, Mine Hill Rd., Roxbury, Conn. 06783, and Robert R. Jackson, Oak Summit Rd., Millbrook, N.Y. 12545

Filed Oct. 16, 1980, Ser. No. 197,651

Int. Cl.³ A47B *39/00*

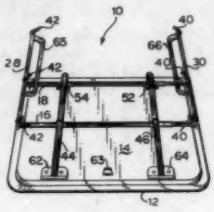
U.S. Cl. 297—153 **7 Claims**

1. A removable wheelchair tray assembly comprising:

a first pair of male and female telescoping members, said male and female members each having a free end;

spring means biasing said male and female members free ends toward one another;

wheelchair arm engaging hook means secured to each of said free ends;



tray support means movably secured to one of said members and adapted to move transversely with respect to said member; and

a tray secured to said support means.

4,373,757

CONVEYOR TROUGH FOR A SCRAPER CONVEYOR FOR USE WITH A MINING MACHINE

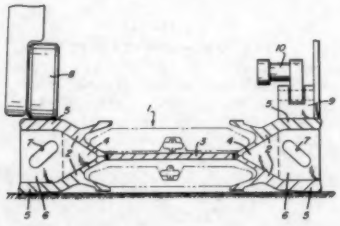
Karl Gehle, and Josef Schreier, both of Bochum, Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,782

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950169

Int. Cl.³ F21C *35/12*

U.S. Cl. 299—43 **7 Claims**



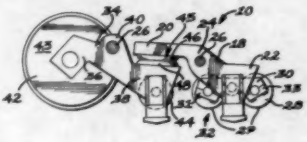
1. A conveyor trough for a scraper conveyor for use with a mining machine in underground mining, said conveyor trough comprising a trough base extending along a plane, diverging arm sections projecting laterally from each of the opposite longitudinal sides of said trough base, the arm sections at each side of the trough base forming intersecting boundaries of a V-shaped space diverging outwardly of the plane of said trough base, a flange extending outwardly from each diverging arm section which descends toward the mine floor, said flange having a width and thickness sufficient to form a machineway, and a machine flange extending from each diverging arm section which ascends above the mine floor, said machine flange having a width and thickness sufficient to form a machineway generally parallel to the mine floor for movement of a mining machine therealong.

4,373,758

MULTIPLE ROLLER BOGEY ASSEMBLY

Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01068, § 371 Date Aug. 10, 1981, § 102(e) Date Aug. 10, 1981
PCT Filed Aug. 10, 1981, Ser. No. 294,759
Int. Cl.³ B62D 55/10, 55/30
U.S. Cl. 305—22 13 Claims



1. An undercarriage (12) adapted for use on a track-type vehicle (14), comprising:

a support frame (16);

a first bogey link (18) having first and second portions (20,22) and a pivot portion (24) intermediate said first and second portions (20,22), said first bogey link (18) being pivotably connected to said support frame (16) at said pivot portion (24);

a second link (34) having a second portion (38) and a pivot portion (40), said second link (34) being pivotably connected to said support frame (16) at said second link pivot portion (40), said second link second portion (38) being adjacent said first bogey link first portion (20), and said second link second portion (38) and said first bogey link first portion (20) each being movable in response to movement of the other;

a first wheel (28) rotatively connected to said first bogey link second portion (22); and

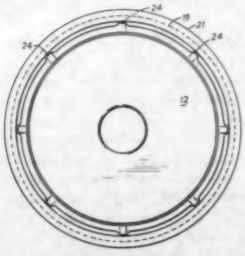
a third wheel (44) rotatively connected to said second link second portion (38), said third wheel (44) being intermediate said first bogey link pivot portion (24) and said second link pivot portion (40).

4,373,759

BEARING ASSEMBLIES FOR CONVEYOR ROLLERS FITTED WITH END COVERS

Brian Greener, Welwyn Garden City; Simon J. Pedder, Luton, and John P. Forknall, Dunstable, all of England, assignors to SKF (U.K.) Limited, Bedfordshire, England

Filed Mar. 10, 1980, Ser. No. 128,895
Claims priority, application United Kingdom, Mar. 9, 1979, 7908395
Int. Cl.³ F16C 33/80, 35/06
U.S. Cl. 308—187.2 9 Claims



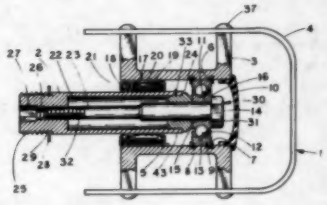
1. An end cap assembly for mounting a roller tube of a roller conveyor on a fixed shaft, comprising an annular housing adapted to be mounted in an end of the roller tube, said housing having an end wall formed with at least one annular tongue and a central recess, a bearing comprising an outer bearing ring firmly secured in said recess in the end wall of the housing, an inner bearing ring, said bearing rings having grooved tracks, and rolling elements mounted in said grooved tracks so that the bearing is adapted to resist radial forces and axial forces in both directions, an annular end cover having a central bore for passage of the shaft therethrough, said end cover having at least one annular tongue and an annular flange which extends as a close fit through the inner bearing ring, the annular tongues on said housing and end cover being interleaved to form a narrow annular tortuous labyrinth passageway between the bearing and the exterior of the end cap assembly, abutments on said end cover which engage opposite sides of the inner bearing ring to secure the end cover axially with respect to the inner bearing ring, whereby the end cap assembly is a self-contained unit in which the rotary component consisting of the housing and outer bearing ring is located axially with respect to the stationary component consisting of the end cover and the inner bearing ring by engagement of the rolling elements in said grooved tracks so that the width of the labyrinth passageway between the two components remains substantially constant, and an annular seal of resilient material compressed axially between the two components and arranged to close the inner end of said labyrinth passageway.

4,373,760

DRAWBOLT BEARING SUPPORT FOR BICYCLE PEDALS

Roger O. Durham, 1370 Thompson St., Glendale, Calif. 91201

Filed Mar. 4, 1981, Ser. No. 240,415
Int. Cl.³ F16C 9/02
U.S. Cl. 308—179.5 2 Claims



1. A drawbolt-type outboard bearing support for bicycle pedals comprising;

(a) an internally-threaded pedal spindle with an outward-facing central bore, a cylindrical outboard end, and an outboard face;

(b) a shoulder bushing having a central aperture, a cylindrical body adapted for closely engaging the outward-facing central bore of said pedal spindle, and a shoulder adapted for abutting the outboard face of said pedal spindle;

(c) a ball bearing means having an inner race with a central aperture and inboard and outboard ends;

(d) a drawbolt member having a threaded inboard end adapted for engaging the internal threads of the pedal spindle, a cylindrical body portion adapted for closely engaging the central aperture of said shoulder bushing, and adapted for engaging the central aperture of said ball bearing inner race, and a head portion adapted for bearing against the outboard end of said ball bearing inner race;

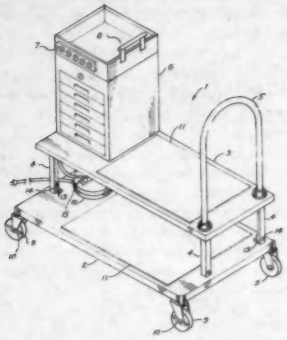
whereby the tightening of said drawbolt member secures the inner race of the ball bearing to the shoulder bushing and also secures the shoulder bushing to the outboard face of the pedal spindle.

4,373,761

COMBINED ARTICLE MOVER AND WORKER SUPPORT

Charles J. Hansberry, Jr., P.O. Box 764, Exton, Pa. 19341

Filed Aug. 22, 1980, Ser. No. 180,480
Int. Cl.³ A47B *83/00*; E04G *3/16*
U.S. Cl. 312—250 **2 Claims**



1. A combined article mover, tool support, and worker support, comprising:

a. a plurality of stepped horizontal platforms the uppermost of which supports a worker and is supported vertically by vertical frame members;

b. handle means, supported by one of said platforms, said handle means projecting vertically above the uppermost of said plurality of platforms, said handle means for both assisting a worker in maintaining balance and for moving the combined article mover, tool support, and worker support; and

c. a receptacle for tools, supported by one of said platforms, said receptacle projecting above the uppermost of said plurality of platforms and including means for assisting in maintaining the balance of a worker; and

d. electrical outlet means supported by one of said platforms.

4,373,762

AUXILIARY CONNECTOR INCLUDING FLIP ADAPTER

Joseph Shekel, New York, and Joseph DeStefano, Carle Place, both of N.Y., assignors to Auto-Line Manufacturing Corp., Copaigue, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,913
Int. Cl.³ H01R *11/24, 27/00*
U.S. Cl. 339—31 B **3 Claims**

1. An auxiliary connector for connection to a top terminal battery and a side terminal battery comprising:

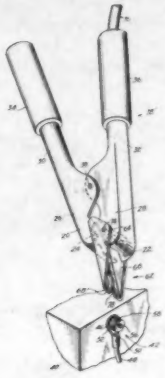
first and second opposed jaws;

means for resiliently urging said first and second opposed jaws toward each other whereby they are effective for grasping a top terminal of a top terminal battery;

an adapter hinged to said first jaw and having first and second positions;

said first position being an inoperative position wherein said adapter is disposed against an outer surface of said first jaws;

said second position being an operative position wherein a portion of said adapter is grasped between said first and second jaws; and



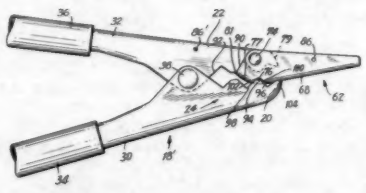
said adapter, when in said second position, having means projecting from between said jaws and effective to engage a side terminal of a side terminal battery.

4,373,763

AUXILIARY CONNECTOR INCLUDING FLIP ADAPTER

Joseph Shekel, New York, and Joseph DeStefano, Carle Place, both of N.Y., assignors to Auto-Line Manufacturing Corp., Copaigue, N.Y.

Filed May 11, 1981, Ser. No. 262,197
Int. Cl.³ H01R *11/24, 27/00*
U.S. Cl. 339—31 B **4 Claims**



1. An auxiliary connector for connection to a top terminal battery and a side terminal battery comprising:

first and second opposed jaws;

means for resiliently urging said first and second opposed jaws together whereby they are effective for grasping a top terminal of a top terminal battery;

an adapter hinged to said first jaw and hingeable between first and second positions;

said first position being an inoperative position wherein said adapter is disposed against an outer surface of said first jaw;

said second position being an operative position wherein said adapter projects from between said first and second opposed jaws and includes attachment means effective to engage a side terminal of a side terminal battery;

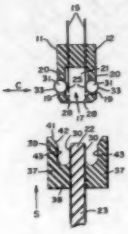
means for locking said adapter in said second position;

said means for locking including at least one tooth on said second jaw and at least one locking slot in said adapter, said locking slot being aligned with, and entered by, said at least one tooth when said first and second jaws are permitted to move together while said adapter is in said second position whereby hinging of said adapter from said second position is prevented.

4,373,764
ELECTRICAL CONNECTOR

Bohdan Ulrich, Kehrsatz, Switzerland, assignor to Hasler AG Bern, Bern, Switzerland

Filed Mar. 3, 1981, Ser. No. 239,892
Claims priority, application Switzerland, Mar. 28, 1980, 2461/80
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—75 MP **28 Claims**



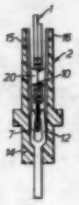
1. Mated connectors for providing a disconnectable electrical contact including
a socket comprising
a support element;
a conducting electrical contact element connected through the support element;
a limb attached to the support element running about parallel to the conducting electrical contact element and having a diameter in a direction about vertical to the surface of the conducting electrical contact element and forming together with the conducting electrical contact element a width in a direction about vertical to the surface of the conducting electrical contact element;
an elastic element captively disposed in a hole in the limb and located closely adjacent to the conducting electrical contact element and protruding on the side of the limb opposite to the location of the conducting electrical contact element and being of larger extension in the direction of the diameter of the limb than the diameter of the limb; and
a plug comprising
a shell;
a conductor disposed on the shell for engaging the conducting electrical contact element;
a clamping arm extending for roughly the same length as the conductor and running about parallel to the conductor at a clearance distance of approximately slightly more than the width of the limb and the conducting electrical contact element and having a bevelled edge near at the tip of the arm disposed toward the conductor and providing at the tip a clearance between conductor and clamping arm of larger than the total width of the elastic element and the conducting electrical contact element.

4,373,765
PLUG CONNECTION FOR RIBBON CABLES

Friedhelm A. Ritter, Gilching, Fed. Rep. of Germany, assignor to Raychem GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 56,227, Jul. 10, 1979, abandoned. This application May 27, 1981, Ser. No. 268,072
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 7821233[U]
Int. Cl.³ H01R *23/66*
U.S. Cl. 339—75 MP **14 Claims**

1. A connection between a relatively flexible ribbon cable and a relatively rigid socket member, wherein said cable comprises a plurality of conductors extending substantially parallel to one another embedded in insulating material, said conductors being exposed along a portion of the cable to provide contact pins and at least two through-holes or at least one depression in each major surface of the cable, said through-holes or depressions being laterally spaced in said insulating material adjacent said contact pins, said cable thereby forming a plug member, and wherein said socket member comprises two integrally-formed guide portions substantially fixed relative to each other and defining therebetween a channel, electrical contact members disposed in said channel, and at least one relatively rigid projection extending from each guide portion

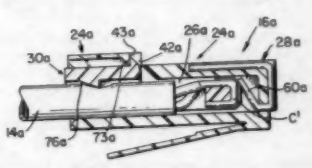


into said channel, with said projections being spaced apart laterally along the length of the channel, aid plug member being receivable in said channel with said contact pins engaging said contact members and being removably anchorable in said channel by engagement from opposite sides between said projections and said through-holes or depressions with each of said through-holes or depressions being engaged by a single projection.

4,373,766
ELECTRICAL CONNECTOR ASSEMBLY

James J. Johnston, Old Saybrook, Conn., assignor to Connector Technology Corporation, Old Saybrook, Conn.

Filed Apr. 29, 1980, Ser. No. 144,830
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—91 R **24 Claims**



1. A connector assembly for terminating an insulated electrical cable including a plurality of electrical conductors having pre-stripped bare end portions without additional structure attached thereto, said connector assembly including a dielectric housing having an axially forwardly extending insert receiving cavity opening through its rear end, a plurality of electrical terminals mounted in said housing, each of said terminals including a portion exposed externally of said housing and a resilient contact portion disposed within said cavity, said contact portion having a normal position within said housing, and insert means at least partially disposed within said cavity for pressing and holding a bare end portion of each one of said conductors without any additional structure attached thereto in direct electrical contacting engagement with a respectively associated one of said resilient contact portions to displace said one resilient contact portion from its normal position to another position within said housing and for cooperating with said housing to maintain an associated portion of the cable spaced from the bare end portions thereof in fixed relation to the connector assembly, said one resilient contact in its other position exerting biasing force directly upon said bare end portion of said one conductor to maintain electrically conducting relation between said one resilient contact and said bare

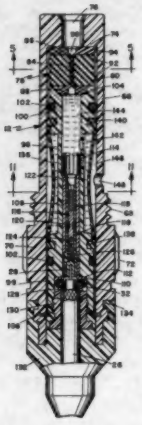
end portion in the absence of any additional terminating structure associated with said bare end portion of said one conductor.

4,373,767

UNDERWATER COAXIAL CONNECTOR

James L. Cairns, 2348 Kentucky Ave., Mims, Fla. 32754

Filed Sep. 22, 1980, Ser. No. 189,950
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—94 C **18 Claims**



1. An underwater coaxial connector, comprising:
a male unit having a hollow cylindrical body with an open end;
a conductive contact probe mounted axially in said body with an entry tip adjacent the open end;
a female unit having a body portion to fit into said hollow body;
a seal mounted in said body portion and having an entry opening to receive the contact probe, said seal including an axially extending, elastomeric cylindrical sealing sleeve which is normally a close sliding fit for the contact probe, and a compressible constrictor surrounding the sealing sleeve and holding the sleeve in a flattened, sealed condition;
a conductive socket member mounted in said body coaxial with the sealing sleeve for engagement by said contact probe;
and securing means for securing the male and female units together.

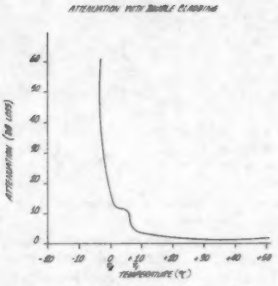
4,373,768

THERMOSTATIC FIBER OPTIC WAVEGUIDES

Raymond Clarke, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 31, 1980, Ser. No. 136,076
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.34 **59 Claims**

54. A waveguide comprising a core, a first light transmissive cladding disposed on and around the exterior surface of the core, and a second cladding disposed on and around the exterior surface of the first cladding, the refractive index of the first cladding being less than the refractive index of the core at temperatures less than a first temperature, T_1, and being greater than or equal to the refractive index of the core at temperatures greater than T_1, the refractive index of the second cladding being less than the refractive index of the first cladding at temperatures less than a second temperature, T_2, and greater than or equal to the refractive index of the first cladding at temperatures greater than T_2, T_2 being greater than T_1, wherein at temperatures less than T_1 the waveguide is capable of transmitting light through the core, and at temperatures less than T_2 and greater than T_1, the waveguide is capable



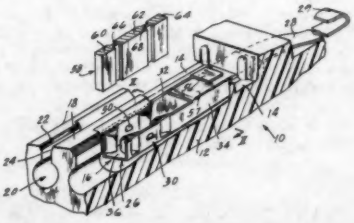
of transmitting light through the first cladding, and at temperatures greater than T_2, substantially no light is transmitted through the core and the first cladding.

4,373,769

ELECTRICAL CONNECTOR INCLUDING INSULATION-OPENING CONTACT

Istvan Mathe, and Alan H. Kasper, both of Cicero, Ill., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 20, 1975, Ser. No. 606,121
Int. Cl.³ H01R *13/38*
U.S. Cl. 339—97 R **52 Claims**



1. An insulation-piercing contact for electrical connection to an insulated conductor, comprising:
a sheet metal structure including first and second surfaces and forming an open channel for receiving an insulated conductor normal to its axis, said channel including a bottom wall and a pair of spaced sidewalls extending generally parallel to each other from said bottom wall; and
at least one pair of interior walls extending inwardly of said channel from respective ones of said sidewalls;
each of said interior walls comprising an oblique portion of one of said surfaces directed away from the respective

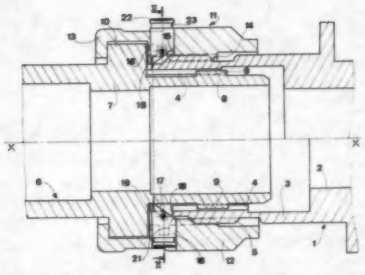
sidewall and toward said bottom wall, a conductor wiping portion of said one surface extending generally in the direction of conductor insertion, an insulation opening portion of said one surface joining said oblique and wiping surface and defining a smoothly rounded blunt nose providing a direction change therebetween, and a smooth portion on said oblique surface immediately adjacent said insulation opening portion.

4,373,770

ELECTRICAL CONNECTOR WITH TACTILE LOCKING TELLTALE

Jacques Raux, Meudon la Foret, and Jacques Benoist, St. Cloud, both of France, assignors to Souriau & Cie, Boulogne-Billancourt, France

Filed Apr. 25, 1980, Ser. No. 143,597
Claims priority, application France, May 8, 1979, 79 11609
Int. Cl.³ H01R *13/64*
U.S. Cl. 339—113 R **12 Claims**



1. A connector having locking indication means for providing an indication within the reach of the fingers of the inspector or tools the inspector is handling when the inspector is unable visually to check the connector comprising a socket having at least one contact terminal and a leading part and a plug member having at least one contact terminal cooperating with said contact terminal on said socket and having a leading part engageable in the leading part of said socket by axial longitudinal movement of said plug therein;

securing means on the outside of said leading part of said socket;

a locking ring for securing in cooperating position said terminals on said plug and said socket;

said ring being retained on said plug and having a leading part thereof provided with complementary securing means on the inner surface thereof cooperating with said securing means on said socket to connect said plug and said socket and lock same;

a radial passage in said leading part of said ring;

tactile locking telltale means received in said passage having said locking indication means;

resilient means on said ring urging said telltale means inwardly of said ring and pressed in the opposite direction by said socket so that said locking indication means projects outwardly of said ring and said connector when said plug and said socket are properly coupled to afford the inspector the opportunity to check said locking indication means when said locking indication means is not visible to the inspector for visually checking said connector;

said telltale means consisting of a pin having an inner end, said end having a surface inclined along the longitudinal axis of said connector and bearing against the inner end of said socket;

said resilient means consisting of a return spring passing through said pin parallel to the inclined surface thereof;

said ring having an internal groove perpendicular to said longitudinal axis of said connector;

said spring being supported in said groove;

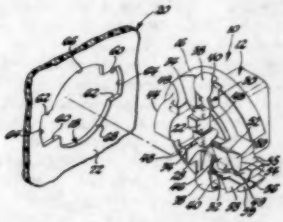
the middle of said spring on each side of said pin being retractable into said groove when said pin is urged by said socket outwardly of said ring.

4,373,771

LAMP SOCKET

William E. Cross, Brookfield, and Robert G. Plyler, Vienna, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1980, Ser. No. 205,718
Int. Cl.³ H02B *1/02*
U.S. Cl. 339—125 L **1 Claim**



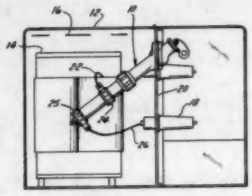
1. A lamp socket assembly adapted to be inserted into a socket opening formed in a mounting panel, said socket opening being generally circular in configuration and formed with a pair of diametrically opposed access slots; a lamp socket adapted to receive a light bulb and having a body portion integrally formed with a collar located in a plane which is perpendicular to the longitudinal center axis of said body portion, said collar having an outer diameter larger than the inner diameter of said socket opening; a pair of retainer members projecting outwardly from said collar and adapted to be inserted into said pair of access slots, each of said retainer members including a ramp portion; a curved cantilevered beam formed integrally with and extending directly from said collar and being located in said plane thereof, said cantilevered beam having a raised locking tab projecting outwardly from the free end of said cantilevered beam, said locking tab being located along an axis parallel to said longitudinal center axis of said body portion whereby insertion of said pair of retainer members into said pair of access slots followed by rotation of said lamp socket in one direction causes said ramp portion to engage a portion of said mounting panel for positioning said portion of said mounting panel between said ramp portion and said collar to thereby hold said lamp socket to said mounting panel from movement along said longitudinal center axis of said body portion while simultaneously causing said cantilevered beam to initially flex about an axis which is perpendicular to and extends towards said longitudinal center axis of said body portion and then move said locking tab into one of said access slots to limit rotational movement of said lamp socket relative to said mounting panel; and a tongue formed with said free end of said cantilevered beam for manually flexing said cantilevered beam about said perpendicular axis for removing said locking tab from said one of said access slots so that rotation of said lamp socket in a direction opposite to said one direction allows said lamp socket to be removed from said socket opening.

4,373,772

BAYONET-TYPE CIRCUIT BREAKER HAVING A MULTIPLE FINGER INTEGRATED CONTACT BAND

John H. Lorenzen, Pewaukee, and John V. Majewski, Hales Corners, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Mar. 27, 1981, Ser. No. 248,564
Int. Cl.³ H01R 13/68
U.S. Cl. 339—130 R 19 Claims



1. In a bayonet-type load break circuit breaker or oil fuse, including a support assembly adapted to be mounted in an opening in the tank for an oil-filled electrical apparatus and a bayonet assembly adapted to be removably insertable into said support assembly, the bayonet assembly including an insulating rod having a conductive bridging circuit member at the inner end of the insulating rod, the conductive member having a pair of contacts, the support assembly including a tubular portion submersible into the oil in the tank and having a number of contact openings to provide access to the contacts on the conductive member, the improvement comprising square contact bands, each formed of an elongate band of conductive metallic material, a number of fingers formed along each band and normally lying in each plane of the band, each of said fingers positioned on one side of said square, each of said fingers including a contact button at the free end, said bands being adapted to be mounted on the tubular portion of the support assembly with the buttons extending through the openings toward the axis of the tubular portion whereby said bayonet assembly will force the buttons outwardly against the bias of the fingers on insertion into the support assembly.

4,373,773

SOCKET TYPE CONTACT ASSEMBLY

R. Amelia Piscitelli; Valentine J. Hemmer, both of Sidney; Charles P. Fischer, and Eric F. Shepler, both of Bainbridge, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 26, 1981, Ser. No. 228,495
Int. Cl.³ H01R 4/10
U.S. Cl. 339—262 R 2 Claims

1. In combination with a three piece contact of the type having: a one piece inner sleeve stamped and formed from a single sheet of metal, said sleeve having a forward mating portion that includes a plurality of deflectable fingers, a rear wire receiving portion and a middle portion; a rear sleeve telescopically mounted to the rear portion of the inner sleeve; and a forward sleeve telescopically mounted to the forward portion of said inner sleeve, the improvement wherein the inner sleeve includes:

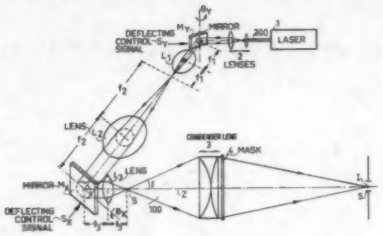
a first uniform thickness extending the entire length of the rear wire receiving portion of said inner sleeve and a second uniform thickness greater than the first thickness, said second thickness extending the entire length of the mating portion of said inner sleeve, whereby the forward mating portion of said inner sleeve is strengthened.

4,373,774

ILLUMINATOR FOR SUPPLYING A DIVERGENT ILLUMINATING BEAM FROM A PREDETERMINED AREA OF A PLANE

Georges Dubroeucq; Michel Lacombat, and Michele Brevignon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 21, 1980, Ser. No. 142,473
Claims priority, application France, Apr. 23, 1979, 79 10209
Int. Cl.³ G02B 27/17, 27/48
U.S. Cl. 350—6.6 3 Claims



1. A device for synthesizing a light source in a predetermined plane, said light source having a regulatable energy distribution and form and acting as an illuminator, said source supplying a divergent illuminating beam from said plane having a predetermined coherence level, comprising:

a coherent radiation source producing a coherent beam;

optical means for controlling the movement of said beam, including electrically controlled optical scanning means for moving the beam in a selected circular pattern so as to change the coherence level and the amount of coherent noise in said beam; and

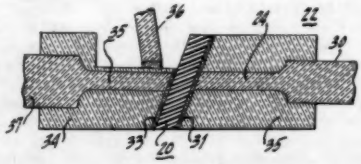
wherein said optical means includes two optical scanning mirrors whose pivoting axes have different directions, two lenses positioned between said two optical scanning mirrors, having a common optical axis and a common focus, and a third lens for focusing the beam from said second mirror to a point source which moves according to the movement of said two scanning mirrors said point source having a variable shape and a predetermined distribution of energy levels.

4,373,775

FIBER DICHROIC COUPLER

George A. Gasparian, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 159,972
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.15 21 Claims



17. An assembly for bidirectional optical signal transmission over a single optical fiber comprising:

a thin film dichroic element of a thickness of less than thirty

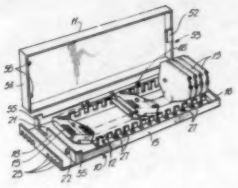
micrometers, an optical fiber attached to said element by a thin layer of adhesive.

4,373,776

PROTECTION CASE FOR OPTICAL FIBER SPLICES

Michael L. Purdy, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 30, 1980, Ser. No. 164,091
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 11 Claims



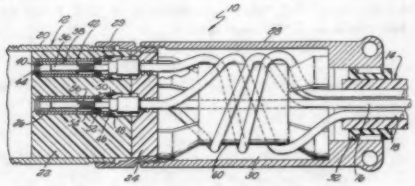
1. A protection case for optical fiber splices, comprising:
an elongate box having a base member and a cover removably attached to the base member;
at least one insert in said base member defining a duct extending along each side of said base member;
a plurality of packet members pivotally attached to the base member, the packet members positioned between the ducts, each packet member including a hinge attached to the base member, the hinges attached at spaced apart positions along a longitudinal axis of the base, the packet members in an overlapping relationship when pivotted down in the base member and pivotal to at least a vertical position, extending up from said base member;
each of said ducts having a side adjacent to said packet members and a plurality of slots in each of said sides, a slot in each side aligned approximately with each hinge, for passage of fibers along each duct and entering to and exiting from said packet members through said slots.

4,373,777

CONNECTOR AND CABLE ASSEMBLY

Leslie M. Borsuk, Los Alamitos, and Patrick G. Corrales, Garden Grove, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,192
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 15 Claims



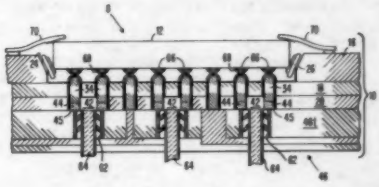
1. A connector and cable assembly comprising:
a combined fiber optic and electrical connector member and a cable containing at least one optical fiber and at least one metallic conductor;
said connector member comprising a support member and a hollow sleeve behind said support member;
said support member containing a plurality of axially extending passages therethrough;
said cable being connected to the rear of said connector member with said metallic conductor extending through said sleeve and terminated to a contact in one of said passages; and
said optical fiber being spirally wound around said sleeve and terminated to a ferrule slidably mounted in another of said passages, said ferrule being adapted for rearward movement in said other passage, the spiral portion of said fiber being free to flex upon rearward movement of said ferrule in said support member.

4,373,778

CONNECTOR IMPLEMENTED WITH FIBER OPTIC MEANS AND SITE THEREIN FOR INTEGRATED CIRCUIT CHIPS

Jawad F. Adham, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,678
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 22 Claims



1. Apparatus for detachably connecting a high density, integrated circuit chip having deformable chip connection pads thereon within said apparatus and for coupling said chip pads to predefined connection points, said apparatus comprising:
(a) a top portion including a distinct conductive layer at the top thereof, said conductive layer having an opening formed therein which extends partially through said conductive layer;
(b) a floor at the bottom of said top portion opening having a first plurality of holes formed therein which extend from said floor completely through the remainder of said top portion and a second plurality of holes also formed in the remainder of said top portion between predetermined ones of said first plurality of holes and extending from the bottom of and partially upward into said top portion;
(c) a plurality of conductive site connection pins mounted one each in said first plurality of holes, said pins including connection pads at the head thereof, said pads extending upwardly from said floor toward said opening;
(d) a bottom portion including an upper insulating layer and at least one conductive layer therebeneath which includes printed circuit leads formed therein, said insulating layer having a third plurality of holes formed therethrough and said bottom portion conductive layer having a fourth plurality of holes formed therein coaxial with each one of said third plurality of holes;
(e) a plurality of light transmission means mounted one each in said fourth plurality of holes and extending therefrom to said connection points;
(f) a plurality of optical transducers, mounted one each in operative association with one of said site connection pins and one of said light transmission means in predetermined ones of said third plurality of holes, for converting electrical signals received from its said associated site connection pin into light signals suitable for transmission along its associated light transmission means to at least one of said remote connection points;
(g) a plurality of optical transducers, mounted one each in operative association with one of said site connection pads and one of said light transmission means in predetermined ones of said third plurality of holes, for converting light

signals received from its said associated light transmission means and at least one of said remote connection points into electrical signals suitable for use in the chip by applying said electrical signals to its associated site connection pin; and

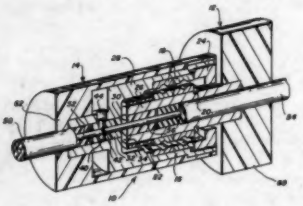
(h) chip retention means, secured to said apparatus at the top of said opening, for retaining a chip in said opening with said site connection pads and said chip connection pads operatively coupled to each other.

4,373,779

SINGLE CHANNEL OPTICAL SLIP RING

Glenn F. Dorsey, Blacksburg, Va., assignor to Litton Systems, Inc., Blacksburg, Va.

Filed Nov. 7, 1980, Ser. No. 204,763
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.21 **2 Claims**



1. A single channel optical slip ring assembly comprising:

a hollow rotor shaft selectively dimensioned for receiving a fiber optic cable,

a rotor bushing mounted in said rotor shaft and having an axial bore for receiving an optic fiber of a fiber optic cable,

a stator cylindrical member selectively dimensioned for receiving a fiber optic cable, and having on one end an axially extending collar,

a stator bushing mounted within said stator proximate said collar having an axial bore for receiving an optic fiber in each end thereof,

means for rotatably mounting said bushing end of said rotor shaft within said collar of said stator cylindrical member so that said rotor bushing bore and said stator bushing bore are aligned along the axis of rotation and said bushings are separated by a selected gap,

a gauging bore in the stator bushing which orthogonally intersects its axial bore,

means in said stator cylindrical member for permitting access to said gauging bore,

a stator fiber optic cable in said stator cylindrical member having an exposed length of optic fiber extending into said stator bushing bore to a selected gauged location within said gauging bore, and

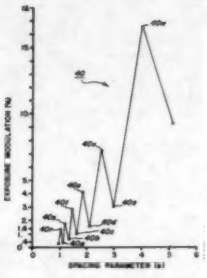
a rotor fiber optic cable in said rotor shaft having an exposed length of optic fiber passing through said rotor bushing bore, across said gap, and into said stator bushing bore to a selected gauged location spaced from said stator optic fiber within said gauging bore, whereby the rotor optic fiber rotates within said stator bushing and the fiber ends are maintained spaced from one another and in axial alignment thereby.

4,373,780

IMAGE TRANSMITTING SYSTEM UTILIZING A GRADIENT INDEX LENS

William L. Lama, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 16, 1980, Ser. No. 159,993
Int. Cl.³ G02B 5/17
U.S. Cl. 350—96.25 **2 Claims**



1. An optical imaging system including a plurality of gradient index fibers combined into at least a single row to form a lens array, said array positioned between an object and image plane so as to transmit light reflected from an object onto said image plane thereby exposing at least a portion of said image plane, said array characterized by producing said exposure with a minimum amount of spatial modulation by optimum selection of a fiber spacing factor b defined by the term

$$b = \frac{-\sec\left(\sqrt{A}\,L/2\right)}{\sqrt{S\,(S+1)}}\,(M)$$

wherein

A = gradient index constant of the fiber

L = fiber length

M = 1,2 = number of rows of fibers

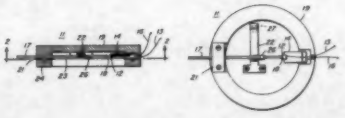
S = 1, 2, 3 . . .

4,373,781

ACOUSTIC TO OPTICAL PULSE CODE MODULATING TRANSDUCER

John Schlafer, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 12, 1979, Ser. No. 11,290
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.29 **7 Claims**



1. An acoustic to optical pulse code modulating transducer comprising:

an optical fiber having a first end and a second end and a central axis;

a diode light source;

a microphone housing;

means coupled to said housing for supporting said fiber at a position displaced from said first end, said first end being oriented within said housing;

means for electrically powering said light source;

electromechanical transducing means coupled to said housing for supporting said light source,

said light source and said optical fiber being so aligned that, when said electromechanical transducing means is unexcited, light from said source is directed through said first end to said optical fiber;

an acoustic diaphragm affixed to said housing;

means coupling said diaphragm to said fiber at a point between said position and said first end for transmitting acoustic frequencies thereto; and

means for exciting said electromechanical transducing means so that said light source is vibrated along a path perpendicular to said axis.

4,373,782

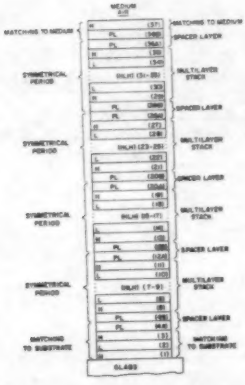
NON-POLARIZING THIN FILM EDGE FILTER

Alfred J. Thelen, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jun. 3, 1980, Ser. No. 156,260

Int. Cl.³ G02B *5/28, 27/10*

U.S. Cl. 350—166 **12 Claims**



1. A thin film optical filter having a bandpass reflectance characteristic with one of the transition wavelength edges thereof being non-polarizing for radiation incident at a preselected non-normal angle, said filter comprising: a transparent substrate having a surface; and a multilayer thin film optical coating provided on said surface, said optical coating including a preselected number of alternate layers of a first higher refractive index dielectric material and a second lower refractive index dielectric material arranged as a sequence of dielectric multilayer stacks with intervening spacer layers formed of one of said dielectric materials, said layers of first and second material in said multilayer stacks having optical thicknesses preselected to produce, for radiation incident at said preselected angle, a spectral response characteristic which has separate bandpass regions with separated low and high wavelength transition edges for the two principal polarization planes if said spacer layers were to have tuned optical thickness, said spacer layers having detuned optical thickness prearranged in accordance with said preselected angle to shift either said low wavelength transition edges or said high wavelength transition edges substantially into alignment.

4,373,783

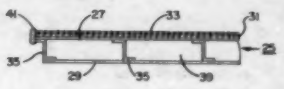
THERMALLY STABILIZED HELIOSTAT

Alfred J. Anderson, Littleton, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 7, 1980, Ser. No. 138,207

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—310 **9 Claims**



1. In a heliostat for reflecting solar energy onto a collector including:

a. a main support structure;

b. means for pivoting and tilting said heliostat so as to keep said solar energy focused on said collector, and

c. a plurality of mirror modules for reflecting said solar energy;

the improvement comprising having each said mirror module thermally stabilized against curvature induced by temperature changes and comprising:

d. internal support structure having sufficient rigidity to support said mirror cantilevered from said main support structure and to withstand predetermined loads;

e. front and back sheets attached to said internal support structure; said front and back sheets having the same coefficient of thermal expansion such that no curvature is induced by temperature changes; said front and back sheets having adequate structural strength to stabilize said internal support structure; and

f. a layer of adhesive grease adhering said mirror to said front sheet; said adhesive grease being water repellant and having adequate set strength to support said mirror and having sufficient shear tolerance to permit differential expansion of said mirror and said front sheet when the temperature changes without inducing stresses or curature effects; said adhesive grease being adapted to prevent fluttering of said mirror with respect to said front sheet and to protect the mirror backside against the adverse effects of weather.

4,373,784

ELECTRODE STRUCTURE ON A MATRIX TYPE LIQUID CRYSTAL PANEL

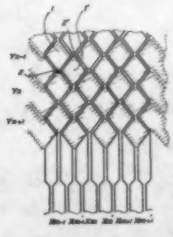
Keisaku Nonomura, Nara; Toshiaki Takamatsu, Tenri; Hisashi Uede, Yamatokoriyama, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1980, Ser. No. 143,097

Claims priority, application Japan, Apr. 27, 1979, 54-57206[U]

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—336 **5 Claims**



1. A matrix type liquid crystal display device comprising:

a plurality of column electrodes;

a plurality of row electrodes corresponding to and generally orthagonal to said column electrodes whereby, corresponding row and column electrodes form diamond-shape picture elements;

each of said diamond-shaped picture elements having a first pair of opposed apices arranged along a line generally extending in the direction of said column electrodes and a second pair of opposed apices arranged along a line generally extending in the direction of said row electrodes;

said first pair of opposed apices of adjacent picture elements being connected to form said column electrodes; and

a layer of liquid crystal material disposed between said column and row electrodes.

4,373,785

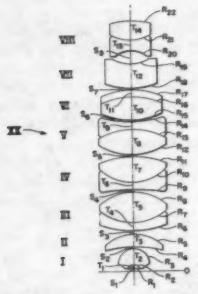
MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, Orchard Park, N.Y., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Apr. 22, 1981, Ser. No. 256,325

Int. Cl.³ G02B *21/02*

U.S. Cl. 350—414 **2 Claims**



1. An eight component, oil immersion apochromatic objective having an N.A. of 1.30 which has a plano-convex doublet I, a concavo-convex singlet II, a biconvex doublet III, a concavo-convex doublet IV, a convex-concavo doublet V, a biconvex doublet VI, a convex-concavo singlet VII and a concavo-convex doublet VIII having the parameters of the respective axial spacings (S_0–S_8) in mm, radii (R_1–R_{22}), in mm with a minus sign (−) indicating a center of curvature on the object side of the lens, thickness (T_1–T_{14}) in mm, indices of refraction (ND_1–ND_{14}) and Abbe numbers (ν_1–ν_{14}) are absolute values, all being determined by the following table:

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No (ν)
			S_1=0.154F		
	$R_1=\infty$				
		T_1=0.313F		$1.535<ND_1<1.545$	$50.5<\nu_1<51.5$
I	R_2=−0.583F				
		T_2=1.568F		$1.88<ND_2<1.89$	$41.5<\nu_2<42.5$
	R_3=−1.356F				
			S_2=0.011F		
	R_4=−9.156F				
II		T_3=1.118F		$1.78<ND_3<1.79$	$50<\nu_3<51$
	R_5=−3.632F				
			S_3=0.291F		
	R_6=8.123F				
		T_4=0.658F		$1.715<ND_4<1.725$	$34<\nu_4<35$
III	R_7=4.399F				
		T_5=2.577F		$1.43<ND_5<1.44$	$95<\nu_5<96$
	R_8=−4.399F				
			S_4=0.252F		
	R_9=−21.809F				

-continued

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No (ν)
		T_6=0.658F		$1.65<ND_6<1.66$	$39<\nu_6<40$
IV	R_{10}=3.907F				
		T_7=2.248F		$1.43<ND_7<1.44$	$95<\nu_7<96$
	R_{11}=7.204F				
			S_5=0.055F		
	R_{12}=5.212F				
		T_8=2.193F		$1.43<ND_8<1.44$	$95<\nu_8<96$
V	R_{13}=−5.869F				
		T_9=0.658F		$1.715<ND_9<1.725$	$34<\nu_9<35$
	R_{14}=10.204F				
			S_6=0.055F		
	R_{15}=6.014F				
		T_{10}=1.919F		$1.43<ND_{10}<1.44$	$95<\nu_{10}<96$
VI	R_{16}=−6.014F				
		T_{11}=0.658F		$1.715<ND_{11}<1.725$	$34<\nu_{11}<35$
	R_{17}=−6.014F				
			S_7=0.055F		
	R_{18}=6.272F				
VII		T_{12}=2.193F		$1.62<ND_{12}<1.63$	$46.5<\nu_{12}<47.5$
	R_{19}=3.098F				
			S_8=1.069F		
	R_{20}=−2.209F				
		T_{13}=0.987F		$1.785<ND_{13}<1.795$	$47<\nu_{13}<48$
VIII	R_{21}=3.410F				
		T_{14}=1.645F		$1.78<ND_{14}<1.79$	$25.5<\nu_{14}<26.5$
	R_{22}=−5.943F				

wherein R is 1.80 to 1.85 mm.

4,373,786

PHOTOGRAPHIC OBJECTIVE OF REDUCED SIZE

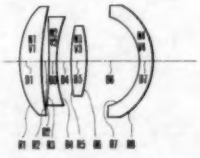
Yasuyuki Yamada, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,630

Claims priority, application Japan, Aug. 19, 1980, 55-114199

Int. Cl.³ G02B *3/04, 9/34*

U.S. Cl. 350—432 **1 Claim**



1. A photographic objective of reduced size including the following various conditions:

from front to rear;

a first lens in the form of a positive meniscus lens convex toward the front;

a second lens in the form of a negative lens;

a third lens in the form of a positive lens;

a fourth lens with the front surface concave toward the front, said concave surface being aspheric and said aspheric surface being figured by the following equation:

$$\Delta X = \frac{(1/R^*)Y^2}{1+\sqrt{1-(Y/R^*)^2}} + A_1Y^2 + A_2Y^4 + A_3Y^6 + \ldots + B_1Y^3 + B_2Y^5 + \ldots - \frac{(1/R)Y^2}{1+\sqrt{1-(Y/R)^2}}$$

where the axial direction is taken as the X-axis, the direction perpendicular to the optical axis as the Y-axis, the

direction in which light advances as positive, and the intersection of the vertex and the X-axis at the original point, and the difference along the X-axis direction between the aspheric surface and the surface obtained by extrapolating the spherical surface contributing to the determination of the focal length is denoted by ΔX, the radius of curvature of the paraxial region by R, the radius of curvature of the standard spherical surface of the lens defined as $R^* = R/(1-2RA_1)$, the aspheric even coefficients by Ai and the aspheric odd coefficients by Bi;

and being characterized by the following numerical values for the radii of curvature of the lens surface Ri numbered the i-th from the front, the lens thicknesses and axial air separations Di, the refractive indices for spectral d lines of the glasses of the lens elements Ni, and Abbe numbers νi of the glasses of the lens elements as related to a focal length of the entire lens system f=100:

F = 100 F-number = 1:3.5 Image Angle 2ω = 63°			
Radius of Curvature	Thickness & Separation	Refractive Index (Nd)	Abbe Number (νd)
R1 = 28.32	D1 = 8.59	N1 = 1.77250	ν1 = 49.6
R2 = 86.00	D2 = 2.66		
R3 = −159.52	D3 = 2.86	N2 = 1.80518	ν2 = 25.4
R4 = 43.65	D4 = 5.33		
R5 = 69.12	D5 = 5.44	N3 = 1.60342	ν3 = 38.0
R6 = −69.12	D6 = 20.51		
R7 = −16.56	D7 = 4.58	N4 = 1.49171	ν4 = 57.4
R8 = −22.20			

Aspherical Coefficients (the Aspheric surface at R7)	
$A1 = -0.17023 \times 10^{-2}$	$B1 = -0.54318 \times 10^{-4}$
$A2 = 0.65538 \times 10^{-5}$	$B2 = 0.73458 \times 10^{-7}$
$A3 = -0.74579 \times 10^{-7}$	$B3 = 0.15509 \times 10^{-8}$
$A4 = 0.28740 \times 10^{-9}$	$B4 = -0.13024 \times 10^{-10}$
$A5 = 0.11786 \times 10^{-12}$	

4,373,787

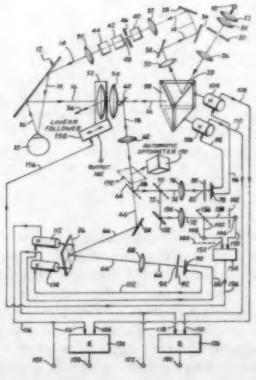
ACCURATE THREE DIMENSIONAL EYE TRACKER

Hewitt D. Crane, 25 Cordova Ct., Portola Valley, Calif. 94025, and Carroll M. Steele, 1979 Scott La., Los Altos, Calif. 94022

Continuation of Ser. No. 16,250, Feb. 28, 1979, abandoned. This application Nov. 13, 1980, Ser. No. 206,489

Int. Cl.³ A61B *3/14, 3/10*

U.S. Cl. 351—210 **4 Claims**



1. A three dimensional eye tracker for measuring, as a function of time, the point in three dimensional space on which the eye is fixed, including

a two dimensional double Purkinje image eye tracker portion for measuring movement of the eye in rotation and translation, said eye tracker incorporating means for forming and directing a beam containing images of first and fourth Purkinje images, measuring means responsive to said first and fourth Purkinje images to generate output signals indicative of eye rotation and translation, optical focusing and positioning means positioned in the path of said images and responsive to said output signals to maintain the position of the first Purkinje image relative to the said eye and focus images from the eye, and

an automatic optometer portion for measuring the refractive power of the eye, having beam generating means for forming an image at the eye and refractive power measuring means responsive to an image containing beam from the eye, at least a portion of said optometer beam path traversing a path including at least a portion of the said optical focusing and positioning means, whereby images formed by the said optometer portion are maintained in focus and stabilized in position.

4,373,788

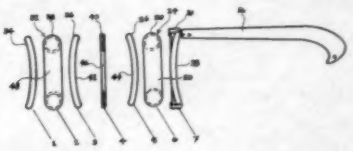
UNDERWATER VISION DEVICE

M. Linton Herbert, 14255 Rosemary La., Apt. 8104, Largo, Fla. 33540

Continuation-in-part of Ser. No. 96,898, Nov. 23, 1979, Pat. No. 4,256,386. This application Jan. 19, 1981, Ser. No. 226,495 The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.

Int. Cl.³ G02C *1/00*

U.S. Cl. 351—43 **20 Claims**



1. An underwater vision device supported by the nose and ears of a wearer comprising:

a. a frame including

(i) a front element having a nose piece for contacting and being supported by the wearer's nose, said front element having first and second apertures aligned with the wearer's eyes;

(ii) a first ear piece coupled to one end of said front element and a second ear piece coupled to one end of said front element, said first and second ear pieces contacting the wearer's ears to maintain said frame in a desired fixed position on the wearer's head;

b. first and second lens elements coupled to said front element in alignment with the first and second apertures, each of said lens elements including

(i) a first lens group having one end coupled to said front element in alignment with one of the apertures therein, said first lens group including

A. a first solid transparent substantially circular lens having a first lens area;

B. a second solid transparent substantially circular lens having a second lens area larger than said first lens area;

C. securing means coupled to said first and second lenses for securing said first and second lenses together and for forming a sealed air chamber between said first and second lenses;

(ii) a second lens group coupled to said first lens group and including

A. a first solid transparent substantially circular lens

having a third lens area larger than the second lens area

B. a second solid transparent substantially circular lens having a fourth lens area larger than said third lens area

C. securing means coupled to said first and second lenses for securing said first and second lenses together and for forming a sealed air chamber between said first and second lenses; and

(iii) spacer means coupled to said first and second lens group for maintaining a predetermined spacing between said first and second lens groups, for maintaining said second lens group in alignment with said first lens group, and for forming a cavity between said first and second lens groups which fills with water when said device is immersed in water.

4,373,789

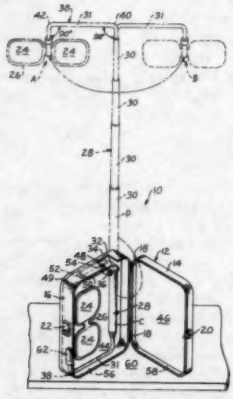
OPTICAL APPARATUS FOR APPLYING MAKE-UP

Lorraine J. Roberts, 301 Diplomat Plz., Morton, Tazewell County, Ill. 61550

Continuation of Ser. No. 42,006, May 24, 1979, abandoned. This application Mar. 18, 1981, Ser. No. 245,022

Int. Cl.³ G02C *1/00, 7/08, 9/02*

U.S. Cl. 351—158 **1 Claim**



1. An optical apparatus for applying make-up comprising,

a housing having a first closure member and a second closure member and a slot formed in the housing, said members being hinged together and adapted to be opened;

a pair of prescription lenses removably mounted in the housing;

means for opening and closing the slot, said means being a cover mounted on the housing adjacent the slot;

an extendable member pivotable at a first end from a first position in the housing adjacent the slot to a second position extending from the housing through the slot; and

means for holding the lenses, said means being attached to a second end of said extendable member,

wherein said housing in its open position will stand on its ends when said extendable member is positioned through said slot.

4,373,790

CAMERA HAVING A FLASHLIGHT PHOTOGRAPHY RECOMMENDATION DEVICE

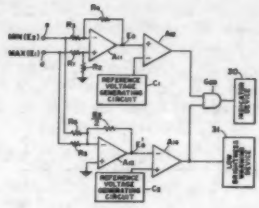
Yoshiaki Ohtsubo, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,180

Claims priority, application Japan, Jul. 30, 1980, 55-103692

Int. Cl.³ G03B *7/00, 15/02*

U.S. Cl. 354—24 **5 Claims**



1. In a camera wherein an object field is divided into a plurality of areas and the brightness of the object field in each of said areas is measured to thereby obtain a plurality of measurement values, a device for recommending auxiliary illumination of the object field, said device including:

(a) means (4) for detecting a maximum value and a minimum value from among said plurality of measurement values;

(b) first judgment means for comparing said maximum value and said minimum value and putting out a first judgment signal when the difference between said maximum value and said minimum value exceeds a predetermined value;

(c) second judgment means for calculating the mean value of said plurality of measurement values and putting out a second judgment signal when said mean value exceeds a reference value; and

(d) means responsive to said first judgment signal and said second judgment signal to indicate the recommendation of said auxiliary illumination.

4,373,791

FOCUSING POSITION DETECTION APPARATUS

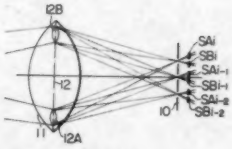
Kunihiko Araki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1980, Ser. No. 122,999

Claims priority, application Japan, Feb. 20, 1979, 54-18919; Feb. 28, 1979, 54-22688

Int. Cl.³ G03B *7/099;* **G01J** *1/20*

U.S. Cl. 354—25 **10 Claims**



3. A focusing position detection apparatus comprising an optical means for dividing rays of image formation light emitted from the exit pupil of a taking lens, photosensor means comprising at least one pair of photosensor elements for receiving said divided rays of image formation light and performing photoelectric conversion of said received rays of image formation light separately from each of said pair of photosensor elements and producing output signals corresponding to the photoelectrically converted rays of image formation light, focusing position detection means for detecting the phase

difference of said output signals produced from said photosensor means and for detecting an in-focus position, and detecting accuracy changing means for automatically changing the accuracy of the in-focus position.

4,373,792

FLASHLIGHT PHOTOGRAPHING DEVICE

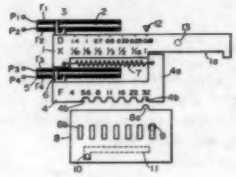
Hideyo Nozawa, Ohmiya; Hideshi Naito, and Kazuyuki Kazami, both of Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

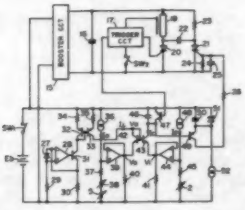
Filed Apr. 21, 1981, Ser. No. 256,195

Claims priority, application Japan, Apr. 25, 1980, 55-55086; Apr. 25, 1980, 55-55087; Apr. 25, 1980, 55-55088

Int. Cl.³ G03B *7/08, 7/16*

U.S. Cl. 354—33 **9 Claims**





1. In a flashlight photographing device including a phototaking lens barrel capable of operatively associating an aperture setting member and a distance adjust member with each other so that the product of an aperture value set by said aperture setting member and an object distance given by said distance adjust member maintains a predetermined value related to the quantity of emitted light of a flash device, the improvement residing in that said phototaking lens barrel includes means for releasing the operative association between said aperture setting member and said distance adjust member; and means for regulating the action of said releasing means to enable independent operations of said aperture setting member and said distance adjust member only within a range in which the product of said aperture value and said object distance does not exceed said predetermined value.

4,373,793

LIGHT MEASURING DEVICE FOR FLASH PHOTOGRAPHY

Nobuyuki Taniguchi, Sakai, and Yoshio Yuasa, Kawachinagano, both of Japan, assignors to Minolta Camera Co., Ltd., Sakai, Japan

Filed Aug. 3, 1981, Ser. No. 289,384

Claims priority, application Japan, Aug. 4, 1980, 55-107607; Aug. 5, 1980, 55-107508; Jul. 21, 1981, 56-114687

Int. Cl.³ G03B *15/05;* **G01J** *1/46;* **H05B** *41/38*

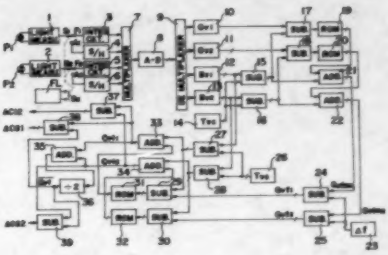
U.S. Cl. 354—31 **35 Claims**

28. Light measuring device for use in flash photography, which measures a preliminary flash light to obtain camera exposure information for photography under a primary flash light, comprising:

at least a pair of means for receiving light coming from a pair of areas of the object field, respectively;

means for producing outputs in response to said light receiving means, respectively;

means for respectively integrating the individual outputs of said producing means during a predetermined period of time including at least the duration time of the preliminary flashing to obtain a first group of signals, respectively;



means for obtaining a second group of signals respectively including light intensity information of said pair of areas without the influence of the preliminary flash light, by utilizing the individual outputs of said producing means, respectively; and

means for processing at least said first and second groups of signals to obtain camera exposure information.

4,373,794

CENTER MASK-PERSPECTIVE PHOTOGRAPHY

William P. Holman, P.O. Box 12, Ord, Nebr. 68862

Filed Nov. 12, 1980, Ser. No. 205,987

Int. Cl.³ G03B *1/00*

U.S. Cl. 354—122 **2 Claims**

1. Camera apparatus for recording images to be viewed with 3D effect when reproduced and wherein an image is to be recorded the distance between the lens of the camera and the scene or object to be photographed is set substantially equal to the intended distance between a viewer and a reproduced image of the recorded image during viewing of the reproduced image, said camera apparatus comprising means associated with said lens for recording an image of the scene or object, an opaque mask covering a central portion of said lens, said opaque mask having a long dimension positioned on said lens in a vertical direction relative to said scene or object and a short dimension positioned on said lens in a horizontal direction relative to said scene or object, said long dimension being substantially equal to the diameter of said lens and said short dimension being equal to 2¼ inches divided by the reduction ratio of said lens.

4,373,795
FILM REWINDING DEVICE FOR CAMERA

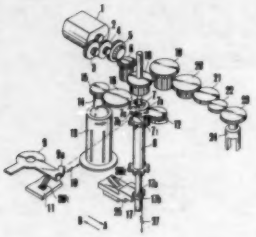
Hiroyuki Kimura, and Tateo Yamada, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,231

Claims priority, application Japan, Apr. 26, 1980, 55-55705; Apr. 26, 1980, 55-55706

Int. Cl.³ G03B *1/18, 17/42*

U.S. Cl. 354—173 **10 Claims**



1. A film rewinding device for a camera including:
a film advancing mechanism;
a charge mechanism;
a film rewinding mechanism;
driving means for carrying out a winding operation of the film advancing mechanism and charge mechanism, and a rewinding operation of the film rewinding mechanism; and
changeover means for carrying out changing of said winding operation and said rewinding operation, said means having:
(a) a control member movable between a first position for cooperation with the film advancing mechanism and a second position for cooperation with the film rewinding mechanism, said control member being driven to move by said driving means;
(b) an operating member for moving said control member from one of the first and second positions to the other; and
(c) an engagement member arranged to engage with said control member when it is at the first position and releasable from the engagement with said control member when it is at the second position, said engagement member being associated with the charge mechanism when it is engaged with the control member, and being associated with the charge member when it is released from the engagement with the control member.

4,373,796
FILM END DETECTOR FOR USE IN AUTOMATIC FILM WINDING CAMERA

Tsuyoshi Matsuura, Ina; Hiroshi Fujiwara, Kawasaki; Mamoru Aihara, Hachioji; Yutaka Takahashi, Hachioji, and Yoshio Nakajima, Hachioji, all of Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

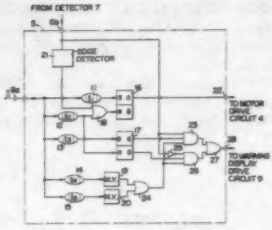
Filed Oct. 16, 1980, Ser. No. 197,665

Claims priority, application Japan, Oct. 26, 1979, 54-147570[U]

Int. Cl.³ G03B *1/18, 17/18*

U.S. Cl. 354—173 **9 Claims**

1. A film end detector for use in an automatic film winding camera comprising:
a motor for automatically winding up a film;
a film winding mechanism connected to the drive shaft of the motor for performing a film winding operation;
a photoelectric detector for optically monitoring the rotation of the motor to produce a first signal indicative of the fact that the operation of the motor is in the course of a film winding operation and a second signal indicative of completion of a film winding by an amount corresponding to one frame; and
a motor drive control circuit for producing a detection gate signal after the completion of an interval required for a



normal film winding by one frame which occurs in response to the drive by the motor and prior to a subsequent automatic film winding operation and for producing a signal representing a logical product of the detection gate signal during and the first signal.

4,373,797
ELECTROMAGNETICALLY DRIVEN SHUTTER

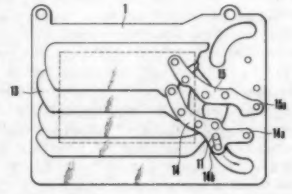
Fumio Shimada, Kawasaki, and Yoji Sugiura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Oct. 5, 1981, Ser. No. 308,564

Claims priority, application Japan, Oct. 8, 1980, 55-143814[U]

Int. Cl.³ G03B *9/08, 9/40*

U.S. Cl. 354—234 **5 Claims**



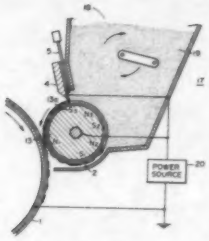
1. An electromagnetically driven shutter comprising:
electromagnetic driving source means;
means for supplying current to said electromagnetic driving source means;
a plurality of shutter blades;
actuating means connected with said shutter blades and receiving the driving force from said electromagnetic driving source means so as to drive the shutter blades for exposure; and
connecting means for connecting said actuating means to said electromagnetic driving source means;
said connecting means being arranged so as to start to move with inception of the current supply to said electromagnetic driving source means and to transmit the driving force thereof to said actuating means with delay after having run a certain determined distance.

4,373,798

DEVELOPING DEVICE WITH SHUTTER BLADE

Shusei Tsukada, Yokohama, and Yasuhide Kurosaki, Mitaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,588
Claims priority, application Japan, Apr. 23, 1979, 54-50547
Int. Cl.³ G03G *15/09*
U.S. Cl. 355—3 DD 21 Claims



1. A developing device for developing a latent image held on a latent image holding member by application of a developing agent to said latent image, which comprises:

(a) developer holding means disposed in confrontation with the latent image holding member;

(b) developer feeding means to feed the developer to the surface of said developer holding means;

(c) regulating means to regulate the thickness of a developer layer on said developer holding means;

(d) shutter blade means of magnetic material or a magnet positioned and arranged for movement between a contact position where said shutter blade means contacts the surface of said developer holding means and a withdrawn position away from the surface of said developer holding means; and

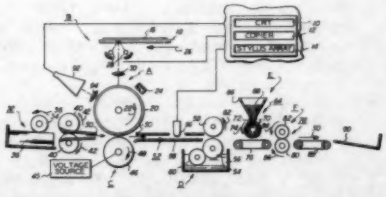
(e) a fixed magnetic field generating means provided at a position opposite to said magnetic shutter blade means with a portion of the developer holding surface interposed therebetween, wherein said magnetic field generating means attracts said shutter blade means to said portion of the developer holding surface.

4,373,799

MULTI-MODE ELECTROSTATOGRAPHIC PRINTING MACHINE

Christopher Snelling, and Myron J. Lenhard, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 28,616, Apr. 9, 1979, abandoned. This application Jan. 15, 1982, Ser. No. 339,539
Int. Cl.³ G03G *15/14, 15/18*
U.S. Cl. 355—3 R 5 Claims



1. A multi-mode electrostatographic printing machine including:

a photoconductive member;

a dielectric member having a substrate coated with a layer of material capable of retaining an electrostatic latent image;

means for transporting said dielectric member along a path of travel which positions said dielectric member closely adjacent to said photoconductive member;

means for charging at least a portion of said photoconductive member to a substantially uniform level;

means for irradiating the charged portion of said photoconductive member with a beam of radiation to record a first electrostatic latent image on said photoconductive member;

means for transferring the first electrostatic latent image from said photoconductive member to said dielectric member;

means positioned along the path of travel of said dielectric member for forming a second electrostatic latent image on said dielectric member;

means for depositing particles on said dielectric member to develop the electrostatic latent image;

means for moistening said dielectric member to increase the conductivity of said dielectric member prior to said depositing means developing the electrostatic latent image with particles;

means for affixing substantially permanently said particles to said dielectric member; and

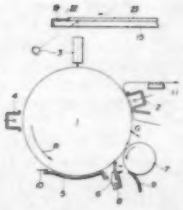
operator selectable means for energizing said charging means, said irradiating means and said forming means simultaneously or energizing either said charging means and said irradiating means or said forming means independently.

4,373,800

WET TYPE ELECTROPHOTOGRAPHIC COPYING MACHINE

Shin-ichi Kamiyama, Yokohama; Kiyoshi Ohshima, Kawasaki; Manabu Mochizuki, Yokohama; Kazuyuki Kato, Tokyo, and Takeshi Saito, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1980, Ser. No. 207,999
Claims priority, application Japan, Dec. 3, 1979, 54-155562; Mar. 24, 1980, 55-36221
Int. Cl.³ G03G *15/10*
U.S. Cl. 355—10 8 Claims



1. In a wet type electrophotographic copying machine capable of performing one copy making process during substantially two revolutions of a photoconductor, which comprises a development section for applying a liquid developer to the surface of a photoconductor which bears an electrostatic latent image, said development section disposed in proximity to the peripheral surface of said photoconductor, along the movement direction of said photoconductor; a cleaning member which is disposed detachably from the surface of said photoconductor on which an electrostatic latent image is formed; and an excess liquid developer elimination member for eliminating the excess developer from the surface of said photoconductor, said excess liquid developer elimination member disposed in proximity to said photoconductor with a small gap therebetween, the improvement comprising means for forming a liquid developer deposition portion by charging and develop-

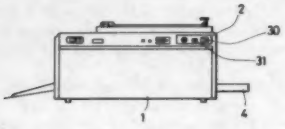
ment on the downstream side of an image formation area on said photoconductor, with respect to the movement direction of said photoconductor, in said image formation area in which an image to be transferred to an image transfer material is formed, said liquid developer deposition portion capable of substantially narrowing the gap between said photoconductor and said excess liquid developer elimination member.

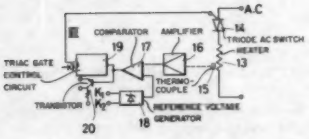
4,373,801

FIXING TEMPERATURE SELECTING CONTROL IN A COPYING MACHINE

Fukusaburo Itoh, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1979, Ser. No. 88,660
Claims priority, application Japan, Oct. 27, 1978, 53-132795
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—14 FU **3 Claims**





1. An electrophotographic copying machine capable of varying the fixing temperature for fusing a toner image formed on copy paper comprising:

a means for forming a toner image on the surface of said copy paper,

a thermal fixing system for fixing said toner image on the surface of said copy paper,

a fixing temperature control circuit which activates said thermal fixing system,

a first manual switch which initiates the copying operation of said copying machine and said fixing temperature control circuit to activate said thermal fixing system to generate a first temperature for fixing said toner image to a first copy paper, and

a second manual switch which initiates the copying operation of said copying machine and said fixing temperature control circuit to activate said thermal fixing system to generate a second temperature for fixing said toner image to a second copy paper.

4,373,802

PRE-OPERATIVE TIME DISPLAY SYSTEM FOR COPYING MACHINES

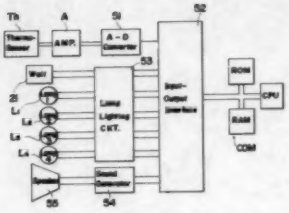
Shizuo Yuge, Toyokawa; Nobuo Kitou, Aichi; Toshio Yamamoto, Toyokawa, and Michiru Kanesaka, Sakai, all of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Dec. 5, 1980, Ser. No. 213,588
Claims priority, application Japan, Dec. 12, 1979, 54-161920
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—14 FU **11 Claims**

1. In an electronic copying machine for reproducing copies of original documents having a heat fixing unit, for fixing toner images formed on the copies, that must be preheated to a predetermined temperature prior to initiation of a copying procedure and having a control console with subjective operator controls to provide a desired operational mode of the copying machine, the improvement comprising:

means for detecting discrete levels of temperature of the heat fixing unit;

control means for providing output signals corresponding to each discrete level of temperature of the heat fixing unit, and



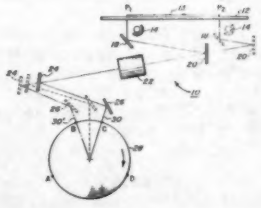
display means operatively positioned relative to the control console and responsive to the output signals to provide an indication to the operator of the status of temperature of the heat fixing unit and its relative timed relationship to the final operative predetermined temperature before initiating a copying operation.

4,373,803

PRECESSION SCANNING SYSTEM FOR COPIER DEVICE

David K. Shogren, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 24, 1980, Ser. No. 190,110
Int. Cl.³ G03G *15/30*
U.S. Cl. 355—49 **6 Claims**



1. A precession scanning system for scanning a document placed on a flat platen and creating a latent image of said document on a drum photoreceptor surface, said system comprising

illumination scanning means for scanning said document including means to move said scanning means from a start-of-scan to an end-of-scan position at a first velocity V_s,

projection means positioned along the system optical path and arranged to transmit reflected images from said document during said scanning towards said photoreceptor,

means for rotating said photoreceptor at a second velocity V_D less than V_s, and

reflector means positioned between said projection means and said photoreceptor, for precessing the projected images onto and along said photoreceptor surface in a direction opposite to the motion of said surface and at a precess velocity V_p equal to $V_s - V_D$ and for movement in synchronism with said scanning means for maintaining the incident angle of said images on said photoreceptor substantially perpendicular to the photoreceptor surface during said scanning.

4,373,804

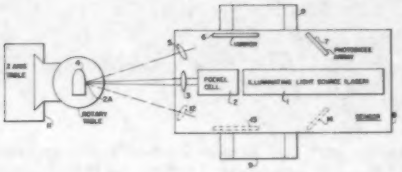
METHOD AND APPARATUS FOR ELECTRO-OPTICALLY DETERMINING THE DIMENSION, LOCATION AND ATTITUDE OF OBJECTS

Timothy R. Pryor; Bernard Hockley; Nick Liptay-Wagner; Omer L. Hageniers, and W. J. Pastorius, all of Windsor, Canada, assignors to Diffracto Ltd., Windsor, Canada

Filed Apr. 30, 1979, Ser. No. 34,278

Int. Cl.³ G01C *3/10*; G01B *11/24*

U.S. Cl. 356—1 **62 Claims**



1. A method for determining the dimension, location or attitude of an object surface, comprising projecting a zone of light onto the surface of said object, said zone comprising at least two bright portions with at least one dark portion therebetween,

forming an image of said zone on said surface onto a photodiode array with lens means whose axis is angularly spaced from the axis of said projected light, said image comprising said two bright portions and said dark portion therebetween;

determining from the position of the dark portion of said image on said array relative to said lens axis the location of said surface illuminated by said zone, and

determining from said location of said surface the location, attitude or dimension of said object.

4,373,805

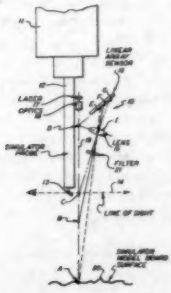
LASER ALTIMETER AND PROBE HEIGHT SENSOR

Richard B. Mallinson, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 35,877, May 3, 1979, abandoned. This application Jan. 27, 1981, Ser. No. 228,858

Int. Cl.³ G01C *3/08, 3/10*; G09B *9/08*

U.S. Cl. 356—4 **6 Claims**



1. In a simulator for providing training in low altitude operation of a flight vehicle, a visual system comprising:

a model board surface on which is arranged a scaled model of a predetermined terrain,

an optical probe for providing a line-of-sight along said terrain on said model board surface,

a laser light source mounted on said optical probe for directing a substantially continuous beam of high intensity light along an axis toward said model board surface to be reflected therefrom,

sensor means mounted on said optical probe in a fixed spatial relationship to said laser light source for developing an electrical signal output indicative of displacement of said laser light that is reflected from said model board surface,

said sensor means having a plurality of separate elongated sensing elements uniformly arranged in a linear scanned array,

first optical lens positioned on said axis to focus said beam of high intensity light sharply at a predetermined point of "minimum" altitude just below the end of said optical probe,

second optical lens positioned to focus at least a portion of said laser light that is reflected from said model board surface to a point on said sensor means,

said second optical lens being positioned substantially perpendicular to a line from said predetermined point of "minimum" altitude just below the end of said optical probe, and

said linearly arranged sensing elements being positioned in a first plane including all of said sensing elements, such that said first plane and a plane including said second optical lens will intersect said axis of the laser light source along a common line, and said common line is perpendicular to said axis of the laser light source,

whereby said laser light that is reflected from said model board surface to said sensor means is in focus over substantially its entire range, with the point of sharpest focus being at said "minimum" altitude.

4,373,806

DYNAMIC TIMING OF ROTATING OR RECIPROCATING MACHINE PARTS

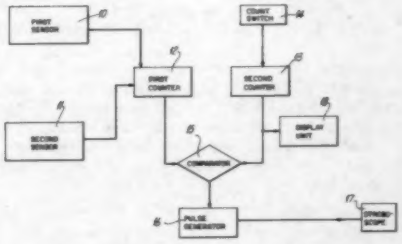
Derrick W. Tipper, Sandiacre, England, assignor to Imperial Group Limited, England

Filed Aug. 26, 1980, Ser. No. 181,405

Claims priority, application United Kingdom, Sep. 12, 1979, 7931700

Int. Cl.³ G01P *3/40*

U.S. Cl. 356—23 **5 Claims**



2. For use in a cyclically operating machine having a periodically moving part, apparatus for identifying at a preselected point in the machine cycle the instantaneous position of that part, said apparatus comprising:

(a) sensor means for detecting the start of each operating cycle of the machine,

(b) a first counter for counting segments of the operating cycle and allocating a count number to each segment, including means for resetting the counting at the start of each cycle,

(c) means for selecting and locating a segment of the operating cycle corresponding to the preselected point, said selecting and locating means comprising a second, variable delay counter, comparator means for comparing the count of the first counter with the count of the second

counter and means for generating said actuating signal when the two counts are coincident,

(d) a stroboscope,

(e) means for delivering to the stroboscope the actuating signal indicative of the locating of said segment, and

(f) means for displaying the count number corresponding to said segment.

4,373,807

METHOD AND APPARATUS FOR THE SIMULTANEOUS MEASUREMENT OF DATA, INCLUDING VELOCITY, RELATING TO SUBMICRONIC PARTICLES IN A STATE OF FLOW IN A FLUID

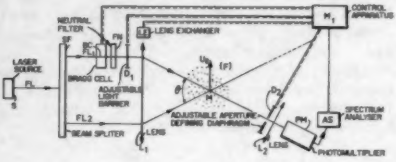
Gerard Gouesbet, Mont Saint Aignan, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Feb. 25, 1980, Ser. No. 124,545

Claims priority, application France, Feb. 27, 1979, 79 05089

Int. Cl.³ G01P *3/36;* G01N *15/02*

U.S. Cl. 356—28.5 **12 Claims**



1. A method for obtaining simultaneous velocity and diameter measurements relating to submicronic particles in a state of flow in a fluid comprising the steps of:

producing first and second parallel beams of coherent light from the same laser beam,

focusing said parallel beams in a measuring zone through which the fluid passes,

initially blocking the passage of said first parallel beam to said measurement zone, detecting at a first solid angle of detection the diffused light issuing from said measurement zone, and spectrally analyzing the detected light over a first frequency range to produce a homodyne spectrum, and,

in response to a predetermined critical frequency, unblocking said first parallel beam, detecting at a second solid angle of detection both the diffused light from said second beam and the light from said first beam issuing from said measurement zone, and spectrally analyzing the detected light over a second frequency range to produce a heterodyne spectrum.

4,373,808

LASER DOPPLER ATTITUDE MEASUREMENT

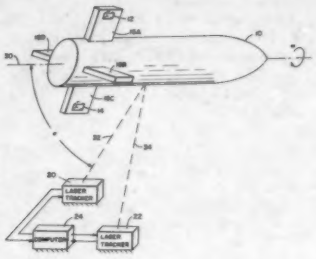
Kynric M. Pell, Laramie, Wyo., and Robert G. Conard, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 20, 1980, Ser. No. 198,322

Int. Cl.³ G01B *11/26;* G01C *1/00*

U.S. Cl. 356—152 **5 Claims**

1. In a tracking system having plural tracking stations for determining the spatial attitude of an object having a longitudinal axis of rotation and wherein a beam of optical energy from a single source is directed from each tracking station toward the object and reflected back to the tracking station from the object, the improvement of first and second optical reflectors disposed on the surface of said object, said reflectors being disposed in a common plane passing through said longitudinal axis and spaced apart on opposite sides of said axis for simultaneously retroreflecting first and second pulses of impinging



optical energy from a tracking station back to that tracking station during each period of periodic rotation.

4,373,809

SOLAR ENERGY FLUX INTEGRATOR

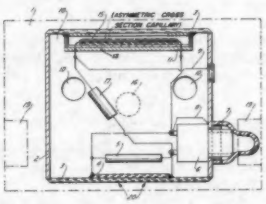
Klaus Gobrecht, Marinesteig 42, 1000 Berlin 38, Fed. Rep. of Germany

Filed Jan. 21, 1980, Ser. No. 114,006

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2925382

Int. Cl.³ G01J *1/44, 1/48*

U.S. Cl. 356—215 **8 Claims**



1. An apparatus for integrating solar energy flux on a plane surface comprising a semiconducting solar cell for receiving a solar energy flux, an electrochemical Micro-Coulombmeter connected to receive current from said solar cell, said Micro-Coulombmeter comprising a glass capillary filled with a mercury salt electrolyte having a bubble therein and the capillary containing two mercury electrodes, whereby current-through said Micro-Coulombmeter results in the transportation of said mercury from the positive to negative pole and the migration of electrolyte to the positive pole, and a resistor connected in series with said Micro-Coulombmeter and having a value to slow the movement of said bubble sufficiently when low levels of said solar energy flux are incident on said cell so that said movement is directly proportional to said incident solar energy flux.

4,373,810

AUTOMATED EXPOSURE-CONTRAST CONTROL INDEX METER

James S. Shreve, 10027 Black Ct., Fairfax, Va. 22032

Filed Jun. 6, 1980, Ser. No. 156,909

Int. Cl.³ G01J *1/44;* G03B *7/24*

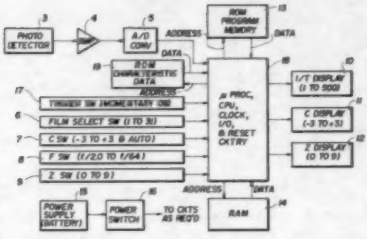
U.S. Cl. 356—226 **15 Claims**

1. An apparatus for determining a film development parameter value and camera exposure setting for subject matter to be photographed which takes into account film non-linearities comprising,

means for storing data which substantially defines a plurality of film characteristic curves corresponding respectively to a like plurality of film development parameter values,

means for sensing the luminous intensity of certain areas of said subject matter and for providing luminous intensity electrical signals which correspond to said sensed luminous intensities,

means for providing film density electrical signals indicative of respective film densities which it is desired for the



respective luminous intensities of said certain areas to produce on said film,

means for retrieving that portion of said stored data which is representative of characteristic curve values which correspond to said respective desired film densities, and

means responsive to said luminous intensity electrical signals, and said film density electrical signals and to said retrieved date for deriving said film development parameter value and camera exposure setting.

4,373,811

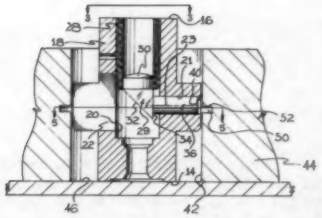
SCOPE FOR VIEWING THE INTERNAL SURFACE OF A BORE OR SIMILAR CAVITY

Ira D. Jones, 1023 S. Main St., South Bend, Ind. 46601

Filed Sep. 26, 1980, Ser. No. 190,998

Int. Cl.³ G02B *23/02*

U.S. Cl. 356—241 **3 Claims**



1. A scope for viewing a machined shape on the surface of a bore or a similar cavity formed in a work member having a well defining said cavity, said scope comprising a housing including a side wall, said side wall defining a longitudinal bore therein, said side wall terminating in an upper end face and a lower end face, said longitudinal bore intersecting said upper end face, a transverse bore extending laterally from said longitudinal bore through said side wall, said transverse bore spaced from said lower end face, a viewer including a viewing end and an image transmitting end, said image transmitting end including means for directing image producing light transversely of said viewing end along a transverse axis and reflecting an image of said shape produced by said light to said viewing end, said viewer fitting within said housing with said viewing end being received in said longitudinal housing bore and said light directing means being aligned with said transverse bore, said viewer image transmitting end including an extending light transmitting rod, said rod projecting into said housing transverse bore when said viewer is fitted within said housing, said rod for transmitting said image producing light from said light directing means along said image transmitting end axis toward said cavity shape and an image of said shape to said light directing means for reflection to said viewer viewing end, said housing including a reference surface selectively spaced from said image transmitting end axis and being adapted to fit into said work member cavity with said transverse bore being aligned with said shape when said housing reference surface abuts a specified reference point.

4,373,812

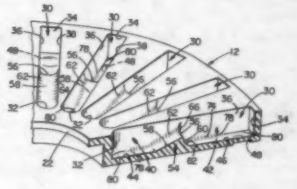
CUVETTE ASSEMBLY

Bernard Stein, Andover; Hamid Keramaty, Lexington, and Romas A. Brickus, Dorchester, all of Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Mar. 25, 1981, Ser. No. 247,351

Int. Cl.³ G01N *21/07*

U.S. Cl. 356—246 **9 Claims**



1. An analysis cuvette for separately storing two reaction constituents, said analysis cuvette having a first condition in which said two constituents are stored separate from one another and a second condition in which said two reaction constituents are mixed together to form a reaction product for analysis comprising

structure defining a first chamber region for receiving a first constituent and having a loading port through which said first constituent is introduced into said first chamber region,

structure defining a second chamber region for storing a second constituent and defining a loading port through which said second constituent is introduced into said second chamber region,

barrier structure between said first and second regions and structure defining a transfer passage between said first and second chamber regions, said barrier structure having a crest portion that defines the lower edge of said transfer passage,

one of said constituents including sample material to be analyzed and the other constituent including reagent material for reaction with said one constituent material to provide a reaction product for analysis,

said second chamber region including an analysis region where said reaction project is subjected to analysis,

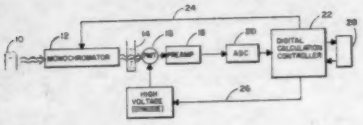
each said chamber region being defined by opposed planar side wall surfaces and a planar base wall surface,

capillary flow inhibiting structure extending from the crest of said barrier structure along the intersections between said barrier structure and said side wall surfaces, and along a portion of the intersections between said side wall surfaces and said base surface of each chamber region.

4,373,813
CONTROL OF SYSTEM ENERGY IN A SINGLE BEAM SPECTROPHOTOMETER

Taylor A. Reid, Newport Beach; James A. Miller, Fullerton, and Duane G. Barber, Yorba Linda, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 7, 1981, Ser. No. 223,054
Int. Cl.³ G01J *3/42*
U.S. Cl. 356—326 **1 Claim**



1. For use in a single-beam spectrophotometer which comprises a light source for illuminating a sample with light energy, a detector for receiving light energy from the sample and generating an output signal proportional thereto, means for changing the wavelength setting of light energy received by the detector, and means for changing output signal gain of the spectrophotometer, a method of controlling maximum system energy during measurement of a sample at a plurality of different wavelength settings within a range of wavelength settings for which system energy varies with wavelength comprising the steps of:

(1) developing a light energy vs. wavelength profile for the spectrophotometer by measuring the output signal at a plurality of different wavelength settings;

(2) storing the measured values of output signal vs. wavelength developed in step (1);

(3) selecting a range of wavelength settings for measuring a sample;

(4) setting the spectrophotometer at a first wavelength setting in the selected range;

(5) adjusting output signal gain of the spectrophotometer at the first wavelength setting until the output signal achieves a maximum or optimum value;

(6) developing from the stored output signal vs. wavelength profile a ratio of (a) the value of the stored output signal at the first wavelength setting in relation to (b) the maximum value of the stored output signal within the range of wavelength settings selected in step (3); and

(7) adjusting spectrophotometer output signal gain at the first wavelength setting until the output signal bears the same ratio to the maximum value of the output signal in step (5) as the ratio developed in step (6), whereby sample measurement at wavelength settings within the selected wavelength range may thereafter be executed without saturating the detector.

4,373,814
COMPACT OPTICAL COUPLING DEVICE AND OPTICAL-FIBER INTERFEROMETER GYROMETER COMPRISING SUCH A DEVICE

Michel Lacombat; Georges Pircher, both of Paris, France, and Herve LeFevre, Stanford, Calif., assignors to Thomson-CSF, Paris, France

Filed May 2, 1980, Ser. No. 146,159
Claims priority, application France, May 2, 1979, 79 11020
Int. Cl.³ G01C *19/64;* G02B *7/26*
U.S. Cl. 356—350 **5 Claims**

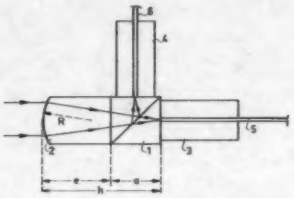
1. A compact optical coupling device for coupling radiation from a source to two fiber ends, comprising:

an optical element for optical radiation separation or recombination having at least one separation or recombination plane and two flat faces symmetrical with respect to said plane,

two end-pieces each having an endmost flat face and a central channel bonded to said element orthogonal to said flat faces,

a fiber end rigidly held in each of said end-pieces being flush with said flat face,

said end-pieces bonded to said faces of said optical separation element symmetrical with respect to said separation or recombination plane,

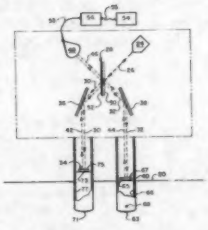


a plano-convex lens whose flat face is bonded to one of said flat faces called input face of the optical element and whose convex input face is such that the radiation having an axis orthogonal to said flat face is focused on said fiber ends.

4,373,815
METHOD AND APPARATUS FOR MEASURING LEAKS IN LIQUID STORAGE VESSELS

Charles R. Bruce, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 5, 1981, Ser. No. 222,806
Int. Cl.³ G01B *11/02*
U.S. Cl. 356—358 **10 Claims**



1. An interferometer apparatus for detecting and measuring the rate of leakage in a liquid storage vessel having liquid contained therein, said interferometer apparatus comprising:

a housing,

means for supporting said housing a predetermined distance above the surface of said liquid in the interior of said vessel,

means in said housing for supplying a first laser beam,

means in said housing for splitting said first laser beam into second and third laser beams,

a first hollow tube downwardly extending from said housing and into said liquid, said first tube having means near its bottom for permitting fluid communication between said liquid and the interior of said first tube, said first tube having its hollow interior opening into said interior of said housing,

means in said first tube having an upper reflective surface for floating on the surface of the liquid contained in said first tube,

a second hollow tube downwardly extending from said housing and into said liquid, said second tube being sealed from said liquid and the aforesaid tube containing a prede-

termined amount of fluid, said second tube having its hollow interior opening into the interior of said housing,

means in said second tube having an upper reflective surface for floating on the surface of the fluid contained in said second tube,

means in said housing for directing said second laser beam onto the reflective surface of said floating means in said second tube and for directing said third laser beam onto the reflective surface of said floating means in said first tube, said directing means being further capable of combining the beams reflected from the two aforesaid reflecting surfaces into a fourth laser beam,

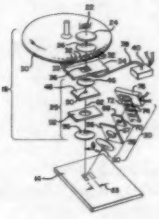
means in said housing receptive of said fourth laser beam for detecting changes in a fringe pattern of the fourth laser beam and for generating a signal representative thereof, said changes being proportional to any leakage into or out of said vessel.

4,373,816

SCANNING BEAM OPTICAL POSITION DETERMINING APPARATUS AND METHOD

Donald L. Laib, Dundee, Oreg., assignor to Morvue, Inc., Portland, Oreg.

Filed Jan. 9, 1981, Ser. No. 223,826
Int. Cl.³ G01B *11/14*
U.S. Cl. 356—375 **23 Claims**



7. Apparatus for measuring the separation between a target surface and a predetermined reference position with a predetermined degree of accuracy within a predetermined range of target surface locations, comprising:

(a) projection means for projecting a pattern of light along a predetermined projection axis and scanning said pattern of light over a target surface at a predetermined sweep rate;

(b) reference means for receiving a reference image of said pattern of light;

(c) reference photosensitive means included in said reference means for producing a reference signal in response to receiving said pattern of light;

(d) receiver means for receiving light reflected from said target surface along a receiver axis having a predetermined angular relationship to said projection axis;

(e) receiver photosensitive means included in said receiver means, for producing a signal in response to receiving a said pattern of a reflected light from said target surface; and

(f) phase detector means for determining the phase relationship between said receiver signal and said reference signal.

4,373,817

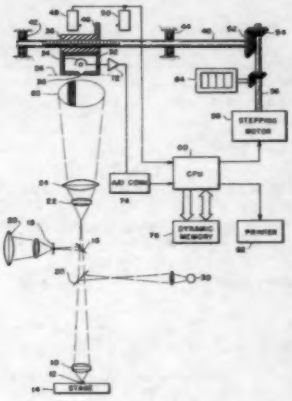
COMPUTERIZED MICROMEASURING SYSTEM AND METHOD THEREFOR

Vincent J. Coates, Cupertino, Calif., assignor to Nanometrics Incorporated, Sunnyvale, Calif.

Filed May 22, 1978, Ser. No. 908,260
Int. Cl.³ G01B *11/02*
U.S. Cl. 356—384 **17 Claims**

1. A system for the measurement of very narrow lines on an object, said system including: microscope means including object illumination means for projecting a magnified image of said object to a focal plane; a photodetector; a housing enclosing said photodetector, said housing having a narrow slit positioned on said focal plane and adjacent said photodetector for transmitting a thin section of said image to said photodetector; a rotatable lead screw on an axis parallel with said focal plane and perpendicular to the slit in said housing; and a traveling nut threaded on said lead screw, said housing being connected to said nut whereby rotation of said lead screw scans said slit across said projected image; the improvement comprising:

a stepping motor coupled to said lead screw, said motor providing a predetermined degree of rotation to said lead screw for each input energizing pulse;



a microcomputer coupled to said photodetector for receiving signals indicative of the amount of radiation sensed by said photodetector, said microcomputer including means for providing energizing pulses to said stepping motor;

a dynamic memory associated with said microcomputer, said memory having means for storing first and second binary coded signals for each position of said stepping motor, said first binary signal representing the photodetector radiation sensed during a reference scan, said second binary signal representing the photodetector radiation sensed during a sample scan; and

ratio means in said microcomputer for dividing said second stored binary signal by said first stored binary signal to obtain a scan ratio at each of said stepping motor positions.

4,373,818

METHOD AND DEVICE FOR ANALYSIS WITH COLOR IDENTIFICATION TEST PAPER

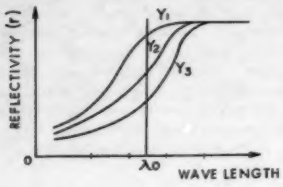
Hiroshi Yamamoto, and Yoshikazu Furutani, both of Kyoto, Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku, Kyoto, Japan

Filed Jan. 23, 1979, Ser. No. 5,859
Claims priority, application Japan, Jan. 25, 1978, 53-7638
Int. Cl.³ G01N *21/27*
U.S. Cl. 356—408 **16 Claims**

1. A method for analyzing concentration of substance under analysis in an electronic analytical instrument having a light source, which method determines the concentration by measuring, at at least one wavelength of interest, light reflected from a test piece of paper bearing the substance and light reflected from a standard having a known reflectivity, and by forming a ratio of these measurements, which ratio is corrected for light source intensity variations and for inner stray rays, said ratio being termed the relative reflectivity of the test piece, said method comprising the steps of:

determining a constant of the instrument useful in correcting

the instrument for the effects of light source intensity variations and inner stray rays;
storing said constant electronically;



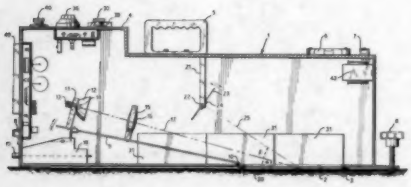
using the stored constant to determine a value proportional to the detected inner stray rays; and
using said value to determine the relative reflectivity of the test piece.

4,373,819

RETROREFLECTOMETER GIVING DIRECT READING

Stefano Pallotta, Rome, Italy

Filed Dec. 22, 1980, Ser. No. 219,390
Claims priority, application Italy, Dec. 21, 1979, 51179 A/79
Int. Cl.³ G01N *21/55*
U.S. Cl. 356—445 **7 Claims**



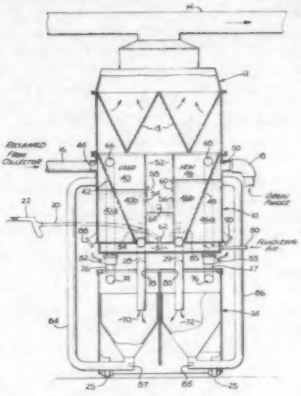
1. A retroreflectometer giving direct readings, for measuring the value or degree of retroreflectivity of a paint applied to the road surface for marking road signs, and consisting essentially of a light-proof box or chamber (1), essentially prismatic in shape, and having in its under-side a rectangular opening or "window" (2) the perimeter of which has a frame (3) of light-proof, flexible material of a kind that will adhere to the surface to which it is placed, the retroreflectometer comprising: a source of light, consisting of a parabolic reflector (12) and a light bulb (14) mounted on a rod (9) free to move in the vertical plane and attached, at one end, to the spindle of a hinge (10) fixed internally to the base of the chamber (1) near the "window" (2) which bounds the sample (20) to be measured, and a convergent lens (16) also mounted on the rod (9) for the purpose of directing on to the sample (20) the beam or ray (17) of light emitted by the source (12, 14) so as to avoid dispersion, the rod (9) being inclinable in relation to the horizontal to at least 3 predetermined angles of inclination, suitable to be selected by means of a selector (18) that can be set from the outside; at least one photo-electric cell (24) able to receive the retroreflected beam or ray of light (25) from the sample (20) under examination, such photo-electric cell (24) being mounted on a small plate (23) fixed to a rotating axle (22) mounted transversely in respect with the side walls of the chamber (1), and in a position such that the length of the retroreflected ray striking the photo-electric cell is about half the focal length of the lens (16)—so that the photo-electric cell (24) is struck by a cone of retroreflected light sufficiently small to obviate the need for optical focusing and/or return systems—, said plate being capable of being set at at least three predetermined angles of inclination, by means of an external knob (26) which turns the axle (22); the value of degree of retroreflectivity of the sample measured by the photo-electric cell (24) being processed, stored and transduced and so made available for reading on display (39).

4,373,820

APPARATUS FOR MIXING RECLAIMED AND VIRGIN POWDER FOR USE IN SPRAY BOOTHS

Jesse Browning, 4217 Via Pinzon, Palos Verdes Estates, Calif. 90274

Filed Mar. 17, 1981, Ser. No. 244,716
Int. Cl.³ B01F *13/02*; G05D *11/02*; B01F *13/00*
U.S. Cl. 366—101 **20 Claims**



1. An automatic mixing device comprising:
a first chamber having a first aperture in communication with a source of reclaimed powder;
a second chamber having a second aperture in communication with a source of virgin powder;
a means for transporting said reclaimed powder to said first chamber and said virgin powder to said second chamber;
a third chamber having a third aperture in communication with said first chamber, a fourth aperture in communication with said second chamber, and a fifth aperture in communication with a powder spray gun;
a means for fluidizing powder in said first, second and third chambers;
control means for adjusting the area of said third and said fourth apertures whereby the rate of flow of reclaimed powder flowing from said first chamber through said third aperture into said third chamber bears a controllable ratio to the flow rate of virgin powder flowing from said second chamber through said fourth aperture into said third chamber;
whereby said powder spray gun is provided through said fifth aperture with a powder mixture comprising controlled proportions of reclaimed and virgin powder.

4,373,821

ELECTRONIC TIMEPIECE GENERATING DIFFERENT ALARM SOUNDS FOR RESPECTIVE DIFFERENT REGIONS

Morio Morishige, Hachioji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,505
Claims priority, application Japan, Aug. 24, 1979, 54-108302
Int. Cl.³ G04B *19/22, 23/02*; G04C *19/00*
U.S. Cl. 368—21 **6 Claims**

1. An electronic timepiece comprising:
a source of reference clock signals;

first time counting means coupled to source of reference clock signals for counting said reference clock signals to obtain time date;

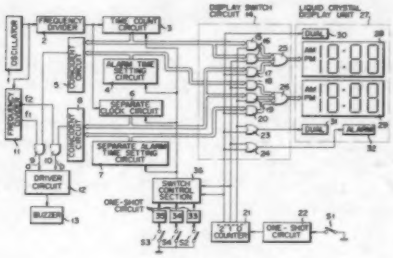
second time counting means coupled to said source of reference signals for obtaining time data which is different from the time date of said first time counting means;

time data display means coupled to said first and second time counting means for displaying the time data obtained from said first and second time counting means;

first alarm time data setting means associated with said first time counting means and being selectively settable to a first alarm time;

second alarm time setting means associated with said second time counting means;

first coincidence signal outputting means coupled to said first time counting means and to said first alarm time data setting means for detecting a coincidence between the



time data of said first time counting means and first alarm time data set in said first alarm time data setting means to output a first coincidence signal;

second coincidence signal outputting means coupled to said second time counting means and to said second alarm time data setting means for detecting a coincidence between the time data of said second time counting means and second alarm time data set in said second alarm time data setting means to output a second coincidence signal; and

alarm informing means for receiving said first and second coincidence signals to produce a first alarm sound responsive to receipt of said first coincidence signal, and a second alarm sound responsive to receipt of said second coincidence signal, said first and second alarm sounds being different from each other and audibly distinguishable from each other.

4,373,822

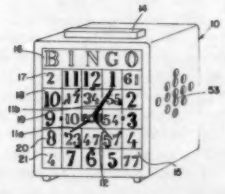
CLOCK WITH SELECTIVE VISUAL ALARM INDICATORS

Frank S. Tkac, 619 Brighton Ave., Pennside, Reading, Pa. 19606

Continuation-in-part of Ser. No. 52,908, Jun. 28, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,803

Int. Cl.³ G04C *21/16*

U.S. Cl. 368—256 **6 Claims**



1. In an electrical alarm clock, a face, time-indicating means associated with the face, an alarm, control means for manually pre-setting the time at which the alarm is activated, alarm-indicator means for showing the time at which the alarm is to be activated, a plurality of independently activated visual signals, each capable of providing at the time of the activation of the alarm a visual effect on a different portion of the face, a plurality of independently activated signal devices associated respectively with said visual signals for the activation thereof for providing a visual effect on only a portion of the face, and means responsive to said control means for selectively setting the time at which the signal device is activated for activating that visual signal which provides a visual effect on that portion of the face associated with the time at which the alarm is activated.

4,373,823

RIBBON GUIDE FOR AN INKED RIBBON CARTRIDGE

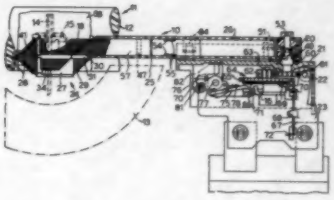
Walter Albrile, Turin, Italy, assignor to Ing. C. Olivetti & C. S.p.A., Ivrea, Italy

Filed Mar. 20, 1980, Ser. No. 132,395

Claims priority, application Italy, Mar. 22, 1979, 67590 A/79

Int. Cl.³ B41J *33/10*

U.S. Cl. 400—196.1 **12 Claims**



1. A cartridge for an inked ribbon for a typewriter of the type comprising a platen including a printing point, type bars individually selectable to strike the printing point, and a support for said cartridge pivoted on an axis substantially perpendicular to said platen for raising the cartridge, wherein said cartridge comprises a container mountable on said support which stores internally the inked ribbon and includes a bottom wall, a cover spaced from the bottom wall a little more than the height of the inked ribbon and two side walls converging toward a narrow area; and a terminal member projecting from the narrow area of the cartridge for guiding a length of the inked ribbon to the exterior of the container from a side of said narrow area to be struck by a selected type bar and to re-enter the container at the same height as that of the internal inking ribbon; wherein said terminal member comprises:

a fixed end mounted on said container and which defines together with said two side walls of the container an entrance slit and an exit slit for the inked ribbon;

a free end opposite to the fixed end and which includes two converging edges;

an intermediate thin portion connected between the fixed end and the free end and which includes a window and a part lying below said window and the bottom wall of the container, said intermediate portion having an inclined edge; and

a further thin portion projecting from said fixed end which defines a gap between said further thin portion and said intermediate thin portion, said further thin portion including a re-entering edge;

wherein said converging edges guide a portion of said length of inked ribbon along a path which comprises a first part wherein the inked ribbon emerges from the exit slit and crosses the window and a second part wherein the inked ribbon lies in front of said part of said intermediate thin portion and below the first part of said path;

wherein the inclined edge of said intermediate thin portion defines an upward path of the inked ribbon which is bent upwardly with respect to the direction of the second part of said path wherein a part of said inked ribbon is confined

in said gap between said further thin portion and said intermediate thin portion;

wherein the re-entering edge of said further thin portion defines a lateral path of the inked ribbon which is bent laterally with respect to the direction of said upward path of the ribbon and wherein the ribbon reenters said container at the same height of the internal ribbon; and

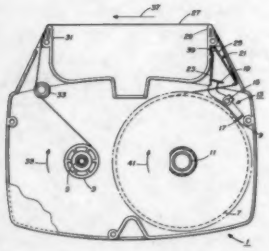
wherein the intermediate thin portion of said terminal member is configured to lie generally parallel to said platen when the cartridge is mounted on its support and to cause the ribbon crossing said window to be positioned in front of the printing point upon the raising of the cartridge and the window to freely accommodate the striking type bar.

4,373,824

RIBBON TENSION AND METERING CONTROL

Alf J. Olsen, Elk Grove Village, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1981, Ser. No. 276,064
Int. Cl.³ B41J *33/52*
U.S. Cl. 400—234 **2 Claims**



1. A web feeding apparatus including means for rotatably supporting a web supply spool and an incrementally operating take-up spool for pulling a web from said supply spool; the improved web tension and metering control comprising:

ratchet teeth mounted on said supply spool;

a pawl mounted adjacent said ratchet teeth and pivotable into locking engagement therewith; and

a single member web tension spring having a first leg and a second leg, said first leg mounted for urging said pawl into locking relationship with said ratchet teeth, said second leg mounted such that as the tension in a web in contact with said second leg increases, said second leg is urged into contact with said pawl in opposition to the action of said first leg to raise said pawl out of locking relationship with said ratchet teeth, and said second leg stores spring energy to maintain constant tension on the web.

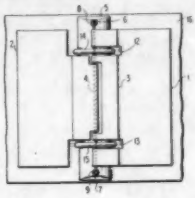
4,373,825

LOOSELEAF PAGE LIFTER

Ray F. Zabielski, P.O. Box 92, Roaring Springs, Tex. 79256

Filed Oct. 10, 1980, Ser. No. 195,758
Int. Cl.³ B42F *13/00*
U.S. Cl. 402—80 L **4 Claims**

1. A page lifting device for use with a looseleaf binder having front and back covers, binding rings and a ring base cover which comprises at least one pair of stiff wire loops rotatably mounted on the top of the ring base cover by a hinge means at or contiguous with the centerline of said ring base cover, said loops being mounted perpendicular to and surrounding at least one of the binding rings and being of sufficient height to freely pass over the binding rings; whereby on closing the looseleaf binder the outermost parts of said loops encounter the inside surfaces of the looseleaf binder's front and back covers, forcing said loops toward the center of said binder and thus forcing the sides of said loops to encounter the bottom edges of any pages contained in said binder, thereby forcing said pages to rise on the binding rings away from the ring base cover toward the uppermost part of said binding rings preventing the pages from being caught between the binding and the inside surfaces of the looseleaf binder's front and back covers, wherein the hinge means by which the stiff wire loops are attached to the top of the ring base cover comprises the ring base cover having two indentations formed in the surface thereof for each of the stiff



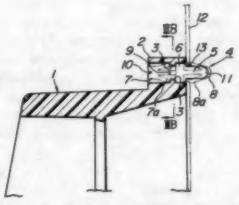
wire loops, at least one end face of each of the indentations having a hole formed therein, and each of the stiff wire loops having its ends angled to lie parallel to the ring base cover; the indentations in said ring base cover and the holes in the faces thereof being located and being of sufficient size to allow the angled ends of the stiff wire loops to be placed therethrough, rotatably attaching the stiff wire loops to the ring base cover.

4,373,826

FASTENER ASSEMBLY

Hiroshi Inamoto; Katsunobu Sobajima, and Shoichi Miyoshi, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd. and Kato Hatsujo Kaisha, Ltd., both of Yokohama, Japan

Filed Jun. 20, 1980, Ser. No. 161,481
Claims priority, application Japan, Jun. 26, 1979, 54-80419
Int. Cl.³ E04B *1/38*
U.S. Cl. 403—14 **4 Claims**



1. A fastener assembly for mounting a constituent member to a receiving member corresponding thereto, comprising:

a hollow cylindrical socket portion integrally formed on the constituent member, said socket portion having a cylindrical opening with a pair of engaging projections extending toward each other in the opening;

a clip having a shaft, a support portion formed at a longitudinal central portion of the shaft and adapted to fit in said opening of the socket portion, a pair of spearhead-shaped snap portions formed at opposite ends of said shaft, whose ends are in the proximity of said support portion, one of which snap portions being adapted to fit in said opening of said socket portion and engage said engaging projections, and at least one small flexible boss formed on said shaft substantially in a plane passing the ends of the spearhead-shaped snap portion to be fitted in said socket, said small boss being angularly offset from said spearhead-shaped snap portion to retain said one of the snap portions in said opening when said one of the snap portions is disengaged from said engaging projections;

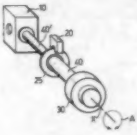
said receiving member being formed with a mounting hole so as to receive the other one of said pair of snap portions, said mounting hole having such a shape that, at a first angular position of said clip relative to the mounting hole, said other snap portion securely engages edges of said mounting hole, while when said clip is at a second angular position, said other snap portion is disengaged from said edges of said mounting hole and said constituent member is removable from the receiving member with said clip carried by the constituent member.

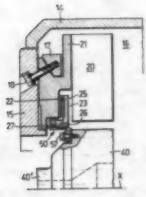
4,373,827

ARRANGEMENT FOR THE RIGID CONNECTION OF A DRIVEN SHAFT WITH A GRADUATED DISK OF A PRECISION MEASURING INSTRUMENT

Klaus Arndt, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Jun. 18, 1981, Ser. No. 274,871
Claims priority, application Switzerland, Jul. 1, 1980, 5055/80
Int. Cl.³ F16L *11/12*; F16D *1/00, 3/00*
U.S. Cl. 403—24 **4 Claims**





1. An arrangement for the rigid connection of a driven shaft with a graduated disk of a precision measuring instrument, in particular for the rigid connection of an optical drive shaft with a coding disk formed of glass for an angle coding device of an observation periscope, comprising:

a compensation ring;

said compensation ring being rigidly connected for rotation with the coding disk and the driven shaft;

said compensation ring being provided with a first flange radially directed towards the outside and a second flange arranged axially offset with respect to the first flange and radially directed towards the inside;

said compensation ring further comprising a substantially cylinder-shaped sleeve portion interconnecting said two flanges; and

said first flange and said sleeve portion being divided into individual ring segments by peripherally distributed slits.

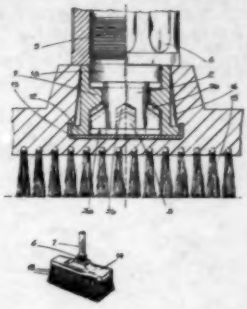
4,373,828

DEVICE FOR RIGIDLY COUPLING A HANDLE TO ITS CORRESPONDING MANUAL INSTRUMENT, AND AN INSTRUMENT PROVIDED WITH THE SAID DEVICE

Francesco Sartori, Via S. Felice, 44, Bologna, Italy

Filed Dec. 17, 1980, Ser. No. 217,459
Claims priority, application Italy, Dec. 21, 1979, 3572 A/79
Int. Cl.³ B25G *3/00*; F16B *9/00*; F16L *41/00*
U.S. Cl. 403—263 **8 Claims**

1. A device for rigidly coupling a handle to a manual instrument comprising a first substantially cylindrical element having a stem of reduced diameter at one end, a shoulder defined between said stem and the remainder of the element, at least one pair of projections provided on the free end of said stem having surfaces which face towards said shoulder and which are at the same level and slope with respect to the cylindrical axis of said element and with respect to a plane perpendicular to said axis, a threaded portion on said first element, a threaded ring nut for insertion on said element and engagement with said threaded portion, a second substantially cylindrical element having an axial hole of slightly greater diameter than that of the first element for receiving the latter and a number of projections numerically identical to or a multiple of the number of projections on said stem, said projections in said hole being so positioned whereby they can be coupled with the projections



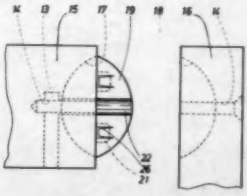
on said stem and having interstices such as to allow the passage therebetween of the projections on said stem, said projections in said hole having surfaces which face towards an end of said hole which receives said first element and which are in the same plane and perpendicular to the cylindrical axis of said second element, and said projections in said hole also having surfaces which face away from the end of said hole which receives said first element which are shaped and sloping so as to accept flush thereagainst the sloping surfaces of the projections on said stem after a limited rotation of the first element with respect to the second element when the first element is inserted into the second element.

4,373,829

DEVICE FOR THE JOINING OF COMPONENTS

Nils Braxell, Kapplandsgatan 96, S-414 78 Göteborg, Sweden

PCT No. PCT/SE79/00231, § 371 Date Jul. 13, 1980, § 102(e) Date Jul. 11, 1980, PCT Pub. No. WO80/00993, PCT Pub. Date May 15, 1980
PCT Filed Nov. 13, 1979, Ser. No. 198,944
Claims priority, application Sweden, Nov. 13, 1978, 7811676
Int. Cl.³ F16B *12/04*
U.S. Cl. 403—267 **4 Claims**



1. A device for connecting components to each other, comprising: at least one connecting piece, which in mounted position of the components is situated in a space formed of recesses in the components in such a manner that they are held together in a definite position, said connecting piece being formed of two thin walls connected to each other at edge-portions and curved outwardly at their center portions, so that a space is

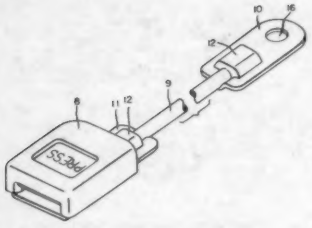
formed between said walls, and at least one opening in said walls, a quantity of glue being placed in said space, the cross-section of the connecting piece at its center portion being larger than the width of said recesses, so that during assembling the double walls are pressed against each other and the glue is pressed out through said at least one opening.

4,373,830

METHOD FOR COUPLING STRANDED CABLE ASSEMBLY TO FITTING COUPLED ARRANGEMENT OBTAINED THEREBY

Haruyuki Ikesue, Fujisawa, Japan, assignor to NSK-Warner K.K., Kanagawa, Japan

Filed Sep. 8, 1980, Ser. No. 185,012
Claims priority, application Japan, Sep. 7, 1979, 54-115005
Int. Cl.³ B25G 3/28
U.S. Cl. 403—284 4 Claims



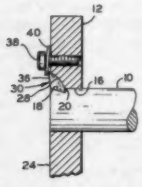
4. A coupled arrangement of a stranded cable assembly and a fitting, in which a sleeve is inserted into an opening provided in the fitting, the stranded cable assembly is inserted into the sleeve, and pressure is applied onto the upper and lower sides of the sleeve in a direction perpendicular to the axial direction thereof to thereby secure said assembly to said sleeve and, at the same time, permit it to bite into the fitting.

4,373,831

KEY DEVICE FOR LOCKING AN ELEMENT TO A SHAFT

John P. Crawford, Marion, Ind., assignor to Thomas A. Grogg and Clarence C. Turner, both of Marion, Ind., part interest to each

Filed Dec. 11, 1981, Ser. No. 329,745
Int. Cl.³ F16D 1/06
U.S. Cl. 403—318 6 Claims



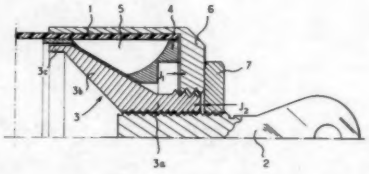
1. A key device for locking an element to a shaft for rotation therewith comprising a shaft having a key-engaging surface provided with first and second opposite ends and which extends axially of said shaft and angles radially inwardly toward the shaft axis from the outer periphery, said first end being at said periphery, said shaft having a radially extending shoulder at said second end, an element having a shaft-receiving opening which receives that portion of said shaft having said key-engaging surface, said element having an outer side and a radially extending keyway which opens through said shaft-receiving opening in registry with said key-engaging surface, said keyway having a rear cam surface which extends angularly from the outer side of said element at a point radially spaced from said shaft-receiving opening to said shoulder on said shaft, a key received by said keyway and provided with a first side portion engaged with said key-engaging surface, a threaded fastener secured to one of said element and shaft and operatively engaged with a second side portion of said key for retaining said key in said keyway and forcing it into engagement with said key-engaging surface, said cam surface being smoothly curved in a direction away from said outer side of said element, said key having a third side portion provided with a curvature which conforms to the curvature of said cam surface.

4,373,832

CONNECTING ROD OR SIMILAR OBJECT HAVING A HOLLOW BODY

Denis Monteillet, Saint Barthelemy de Vals, France, assignor to Societe Anonyme de Recherches de Mecanique Appliquee, Saint Vallier sur Rhone, France

Filed Nov. 6, 1980, Ser. No. 204,766
Claims priority, application France, Nov. 8, 1979, 7928012
Int. Cl.³ F16B 2/14
U.S. Cl. 403—374 3 Claims



1. A connecting rod for transmitting longitudinal stress, comprising a fibrous tubular body having internal and external diameters and a first end, a connecting end member at said first end of said body, a brace member having internal screw threads and comprising an external frusto-conical section, a radially expansible element having an internal frusto-conical section with the same conicity as said frusto-conical section of said brace member, having an external diameter substantially equal to said internal diameter of said body, and being mounted on said brace member, and a cap surrounding said first end of said tubular body with an internal diameter substantially equal to said external diameter of said body, said connecting end member being independent of said brace member and having external screw threads engaged with said internal screw threads of said brace member, said expansible element comprising an annular member having longitudinal slots therethrough closed at both ends, and said cap being screwed on said brace member.

4,373,833

MACHINE FOR USE IN IMPLANTING PLANT SUPPORTING STAKES

Kazuki Watanabe, P.O. Box 127, Oceanside, Calif. 92054

Filed Nov. 3, 1980, Ser. No. 203,335
Int. Cl.³ E02F 5/10
U.S. Cl. 405—36 14 Claims

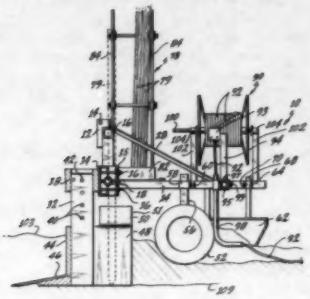
1. A trenching machine to be drawn behind a mobile power unit for use in implanting into the earth support stakes for growing plants;

trenching means for forming a trench in the earth over which the machine traverses;

first guide means for guiding said stakes to a substantially vertical position within said trench;

tamper means for tamping the earth adjacent said trench inserted stakes;

scraper means for scraping at least a portion of the earth disturbed in forming said trench into said trench and for substantially leveling said disturbed earth adjacent thereto; and



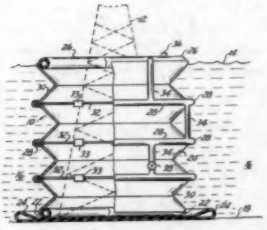
means for depositing irrigation hose adjacent to said trench prior to scraping at least a portion of the earth disturbed in forming said trench into said trench and substantially leveling said disturbed earth.

4,373,834

PORTABLE OFF SHORE WELL INSTALLATION APPARATUS

Frederick J. Grace, 11 Menemsha Way, P.O. Box 151, East Falmouth, Mass. 02536

Filed Dec. 1, 1980, Ser. No. 211,829
Int. Cl.³ E02B 15/04
U.S. Cl. 405—60 **12 Claims**



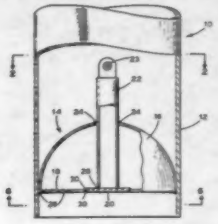
1. A portable off shore well installation apparatus for positioning around drilling equipment between the surface of a body of water and the ground below the water for surrounding a well head to entrap contaminants resulting from drilling operations, said apparatus comprising a curtain having an axially extendable water impermeable sleeve, a submerged ground conforming anchor ring attached at one end of said extendable sleeve, and a float ring for extending said extendable sleeve to the surface of the water attached at the other end of said extendable sleeve, wherein said extendable sleeve has a plurality of longitudinally spaced buoyant rings attached about the periphery thereof to provide lift and rapid substantially uniform extension of said extendable sleeve and said anchor ring is made of a flexible impermeable material which is fillable with a non-buoyant non-rigid substance.

4,373,835

REMOVABLE CLOSURE PLATE

James A. Haney, New Orleans, La., assignor to McDermott Incorporated, New Orleans, La.

Filed Jun. 23, 1980, Ser. No. 161,988
Int. Cl.³ F02B 17/04
U.S. Cl. 405—195 **10 Claims**



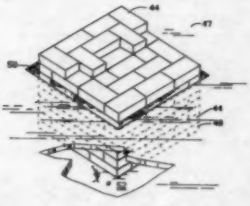
1. An improved removable closure plate of the type used in an elongated hollow tubular column structure which is adapted to be floated to an offshore site where it is immersed by flooding for installation in an upright position wherein the closure plate includes upper and lower portions, a centrally located pull member, the pull member extending through an aperture located in said upper portion and further being removably connected to the upper portion in a liquid tight manner and rigidly connected to the lower portion, the lower portion having a plurality of apertures disposed therein, the closure plate having its circumferential periphery removably connected to the inside surface of the column to form a liquid tight seal, and means for disengaging the closure plate from the column by exerting a force on the pull member sufficient to first rupture the seal about the upper portion and by maintaining a force sufficient to then rupture the seal between the closure plate and the column.

4,373,836

ICE ISLAND CONSTRUCTION

Gordon F. N. Cox, Lyme Center, and Feng H. Hsu, Tulsa, both of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 11, 1981, Ser. No. 233,349
Int. Cl.³ E02B 3/00; F25C 1/02
U.S. Cl. 405—217 **9 Claims**



1. A method of constructing an artificial ice island in a marine body of water covered by natural sheet ice in subfreezing temperatures, which comprises:

selecting an area for the ice island;

mining blocks of ice from the natural ice sheet outside said selected area;

cooling said fine blocks by storing them in contact with the air;

then using said cured ice blocks to construct a layer of constructed ice directly on said ice sheet of sufficient mass

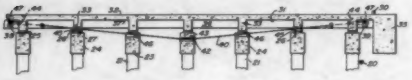
so that the natural ice sheet beneath the ice blocks rests on the bottom of the body of water.

4,373,837

PIER WITH PRESTRESSED RESILIANT INTEGRAL DECK TO ABSORB DOCKING FORCES OF SHIPS

Tung-Yen Lin, El Cerrito, and Philip Y. Chow, Orinda, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Filed May 28, 1981, Ser. No. 267,708
Int. Cl.³ B63C *1/00*
U.S. Cl. 405—218 11 Claims



3. A pier, including in combination:

supporting piles,

horizontal pile caps surmounting and connecting said piles together in transverse rows, said pile caps having upper coplanar surfaces with metal bearing strips thereon,

an integrated one-piece deck with an upper surface and bottom surface having transversely extending beams supported atop said pile caps so that it is slidable on said metal bearing strips, having longitudinal depending struts, and having exposed depending wharf edges, and

a series of prestressing post-tensioned tendons each slidably connecting said deck to said pile caps,

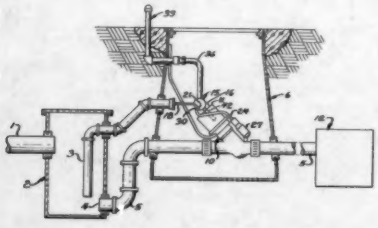
whereby, when a wharf is struck by a ship, the internal work performed by the lengthening and shortening of the tendons and by the sliding friction between the deck and the pile caps absorbs the impact loads.

4,373,838

VACUUM SEWAGE TRANSPORT SYSTEM

Brian E. Foreman, and John M. Grooms, both of Rochester, Ind., assignors to Burton Mechanical Contractors Inc., Rochester, Ind.

Filed Feb. 13, 1981, Ser. No. 234,110
Int. Cl.³ B01D *1/00;* B65G *53/00*
U.S. Cl. 406—14 14 Claims



1. A vacuum sewage transport system comprising

a sewage holding means,

a sewage transport conduit connected to the holding means at one end and a sewage collecting means at another end for collection of sewage from the holding means,

valve means in the transport conduit disposed between the holding means and the collecting means to selectively control sewage transport from the holding means to the collecting means,

means for maintaining low pressure or vacuum conditions in the conduit between the valve means and the collecting means,

the valve means being operated by differential pressure applied thereto to open and close the sewage transport conduit and selectively permit sewage transport from the holding means to the collecting means,

a pressure differential operated apparatus for automatically controlling the operation of the valve means in the transport conduit to selectively control the alternate opening and closing of the valve means and transport conduit and to thereby control the flow therethrough of sewage from the holding means to the collecting means, the apparatus having a pressure sensor means connected at one end in pressure communication with the sewage holding means but closed to fluid communication through the sensor means to the holding means,

the pressure sensor means connected at another end in pressure communication with the valve means through sequentially activated differential pressure responsive control elements disposed between the pressure sensor means and the valve means and including means for alternately connecting the elements to the low or vacuum pressure in the transport conduit and a source of relatively higher pressure,

the sensor means acting to sense pressure variations in the sewage holding means and in response to a predetermined sensed pressure condition in the holding means to sequentially activate the differential pressure responsive control elements to operate the valve means to open the sewage transport conduit and permit sewage transport from the holding means to the collecting means, and

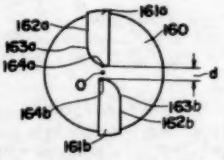
means for closing the valve means by sequentially reversing activation of the differential pressure responsive control elements in response to another pressure condition in the holding means, and automatically conditioning the pressure sensor means without fluid communication through the sensor means to the holding means for subsequent pressure responsive sewage transport.

4,373,839

DRILL BIT

Hideo Negishi; Kaoru Goto, both of Tokyo, and Sueji Takaya, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1980, Ser. No. 192,627
Claims priority, application Japan, Oct. 2, 1979, 54-127046; Nov. 15, 1979, 54-158626[U]; Nov. 15, 1979, 54-158627[U]; Nov. 15, 1979, 54-158628[U]; Dec. 29, 1979, 54-182582[U]; Dec. 29, 1979, 54-182583[U]; Feb. 15, 1980, 55-17567; Jul. 10, 1980, 55-94389; Aug. 28, 1980, 55-122286[U]
Int. Cl.³ B23B *51/00, 51/02, 51/06*
U.S. Cl. 408—59 9 Claims



1. A drill bit for drilling a hole in a metal workpiece which comprises a body having a shank portion and an end face at its forward end and an axis of rotation therethrough, said body having at its forward end a pair of cutting means each having at least one cutting edge, said cutting edges being disposed symmetrically relative to said axis of rotation, each cutting edge having a first and second portion, the said first portion of one of said cutting edges lying on one side of a common diameter and the said first portion of the other cutting edge lying on the opposite side of said common diameter, each said first

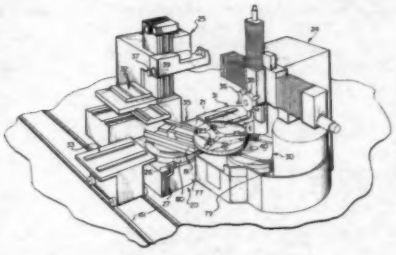
portion being remote from said axis of rotation and each lying substantially along a straight line, each said second portion extending generally convexly arcuately from one end of said respective first portion to the end of said respective cutting edge, said respective end of said cutting edge being located on the side of said common diameter opposite to the side on which said respective first portion of said respective cutting edge lies, the radially innermost point of said second portions of said cutting edges being equally spaced from said axis of rotation by a distance between 0.1 to 1.25 mm to thereby define a groove having walls between said cutting means, the depth of said groove being not less than 0.2 mm whereby a central core formed in said groove during a drilling operation will be twisted off by the opposed walls of said groove, the opposed walls of said groove extending along said axis of rotation.

4,373,840

PALLET TRANSFER SYSTEM

Leonard A. Miller, Jr., Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Mar. 28, 1980, Ser. No. 135,037
Int. Cl.³ B23Q *7/02*
U.S. Cl. 414—225 **45 Claims**



1. A workpiece handling system for transferring workpieces between a number of stations, each station having a pallet receiving device, the system comprising the combination of a stand having a rotatable slideways base, a slideways ram carried for reciprocation on the slideways base and adapted to receive workpiece-carrying pallets, a latch means carried for reciprocation on the ram for engaging the pallet and drawing the pallet over the ram, and alignment means for aligning a pallet receiving device located at a station with the ram, the alignment means including male alignment means having at least one beveled surface and carried on one of the ram and pallet receiving devices, and female alignment receiving means having surfaces matable with the male alignment means and carried on the other of the ram and pallet receiving device for receivably engaging the male alignment device.

4,373,841

QUICK RELEASE LOAD SECURING DEVICE

Franklin P. Adler, Michigan City, Ind., and Rudolph E. Nadherny, Naperville, Ill., assignors to Illinois Railway Equipment Company, Chicago, Ill.

Filed Oct. 6, 1980, Ser. No. 194,059
Int. Cl.³ B60P *7/10*; B61D *3/16*, *45/00*
U.S. Cl. 410—34 **23 Claims**

1. Integral, telescoping quick-release device for anchoring lading strapping to railway freight cars, comprising:

a housing secured to a railway freight car, said housing having an opening through an upper panel thereof;

a sleeve in sliding, operative interengagement with said housing, said sleeve having a longitudinal axis, at least a portion of said sleeve being slidable through said opening of the housing, said sleeve having a bore;

abutment means of said sleeve for engaging the upper panel of the housing at a location to prevent upward passage of said sleeve completely through said opening;

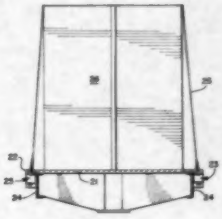
an anchor rod in sliding, operative interengagement with said sleeve, at least a portion of said anchor rod being slidable through said bore of the sleeve;

snubber means secured to said anchor rod;

receiving means on said anchor rod for securing a length of lading strapping to the quick-release device and for transmitting tension within the lading strapping to the snubber means; and

locking means for rotation about the longitudinal axis of said sleeve, said locking means engaging said sleeve with said housing at a locked position in which said sleeve is collapsed within said housing and for rotationally unlocking the quick-release device to reduce the tension within the snubber means.

21. The combination of a railway freight car of the type having a deck and a side sill with a device for securing cargo thereonto by lengths of lading strapping anchored by a quick-release device having receiving means for holding the lading strapping over the cargo, the quick-release device being an integral, telescoping device comprising:



a housing secured to the side sill of the railway freight car, said housing having an opening through an upper panel thereof;

a sleeve in sliding, operative interengagement with said housing, said sleeve having a longitudinal axis, at least a portion of said sleeve being slidable through said opening of the housing, said sleeve having a bore;

abutment means of said sleeve for engaging said upper panel of the housing at a location to prevent upward passage of said sleeve completely through said opening;

said receiving means including an anchor rod in sliding, operative interengagement with said sleeve, at least a portion of said anchor rod being slidable through said bore of the sleeve;

snubber means secured to said anchor rod, said snubber means being tensioned by tension within the lading strapping;

locking means for rotation about the longitudinal axis of said sleeve, said locking means engaging said sleeve with said housing at a locked position in which said sleeve is collapsed within said housing and for rotationally unlocking the quick-release device to reduce the tension within the snubber means.

4,373,842

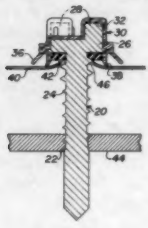
PLASTIC-HEADED FASTENER ASSEMBLY

John E. Bettini, Elgin, and John F. Nelson, New Lenox, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 20, 1980, Ser. No. 198,686
Int. Cl.³ F16B *23/00*
U.S. Cl. 411—377 **5 Claims**

1. A plastic-headed fastener assembly for use in attaching a first panel of a first thickness to a second substantially thicker member comprising a metal screw fastener having a threaded shank and having a head at one end thereof, said head having rotation inducing surfaces, the threads beneath the head having

a first outside diameter; a plastic head member overlying the metallic head and being affixed thereto, said plastic head mating with and transmitting the rotational forces to the metallic head, a first outer sealing flange of the plastic head member extending outwardly and downwardly from the edge of the underlying metallic head, said downward extent being for a first axial distance relative to the screw, a second inner sealing flange extending generally downwardly and substantially parallel to the axis of said fastener for a second axial distance



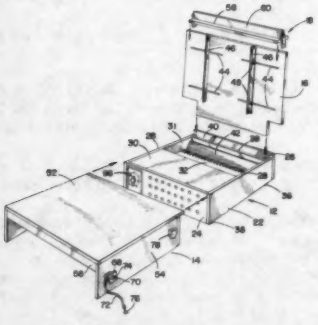
relative to the screw, said second axial distance being substantially greater than said first axial distance, the second sealing flange having an inside diameter which is greater than said first outside diameter by at least several times the first panel thickness whereby said second sealing flange acts to prevent the creation of significant friction between the plastic head member and the panel being attached by allowing said fastener to easily strip out a hole in said first panel before fully engaging said second member.

4,373,843

PADDING PRESS

Franklin D. Lang, Mission Viejo, Calif., assignor to Nitney Corporation, Laguna Hills, Calif.

Filed May 4, 1981, Ser. No. 259,972
Int. Cl.³ B42C *13/04*; B30B *1/30*
U.S. Cl. 412—10 **20 Claims**



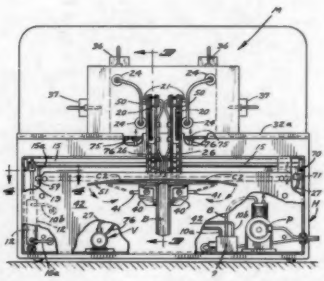
1. An apparatus for padding paper comprising:
a base member including a top surface;
a support board assembly slideable upon the top surface of the base member, the support board assembly including a main support board and a catch member which is adapted to limit the sliding motion of the support board assembly on the base member so as to cause the support board assembly to occupy at least one predetermined position on the base member;
an adjusting board removably attachable to the base member in a position wherein the adjusting board is substantially orthogonal to the main support board;
a clamping board adapted for exerting a downwardly projecting clamping force upon a stack of paper positioned between the main support board and the clamping board;
clamping means attached to the clamping board and the support board assembly for applying the clamping force upon the clamping board;
adjusting means including a pair of parallel disposed adjusting rails, for continuously adjusting a gap adapted to align the stack of paper in operative position on the main support board, the adjusting means being attached to the adjusting board, and
blower means incorporated in the base member and actuable at the option of an operator for blowing air upon a glued edge of the stack of paper clamped between the main support board and the clamping board.

4,373,844

SEMIAUTOMATIC MACHINE FOR ASSEMBLING PAPER DUST JACKETS ON NEW HARD COVER BOOKS

John A. Conroy, 14833 Furman St., Forest Lake, Minn. 55025

Filed Oct. 14, 1980, Ser. No. 196,435
Int. Cl.³ B24C *5/00*
U.S. Cl. 412—24 **8 Claims**

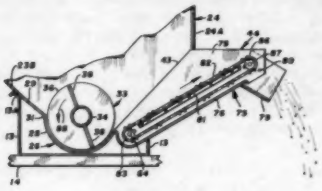


1. A semiautomatic book jacket assembling machine comprising,
a base structure,
means for supporting a stack of paper book jackets in predetermined position on the base,
means for positioning a book in predetermined position on the base with the two covers positively held in opened co-plannar, substantially horizontal relationship,
gripping means for engaging and holding the outer jacket in the stack,
power-actuated transfer means mounted on the base for removing the jackets one at a time from said supply stack and transferring the same to the cover of a book held by said positioning means in centered relationship on said book cover to permit an operator to fold the flap portions around the cover and complete the assembly operation,
said jacket gripping means includes a plurality of suction cups,
said transfer means includes a transfer arm assembly carrying said suction cups to move the jackets one at a time from stacked position to discharge position on said opened book cover, and
also including means for rotating each jacket from the plane defined by the outer jacket of the supply stack to the plane defined by the opened book cover.

4,373,845
ANIMAL FEED TRANSPORT AND SELF-UNLOADING VEHICLE

Donald L. Henke, Maple Plain, Minn., assignor to Veda, Inc., Long Lake, Minn.

Continuation-in-part of Ser. No. 955,971, Oct. 30, 1978, abandoned. This application Jan. 7, 1981, Ser. No. 222,963
Int. Cl.³ B60P *1/42*
U.S. Cl. 414—326 **3 Claims**



1. An animal roughage feed handling apparatus for delivering roughage feed to a selected location comprising: a hopper having a first upper side wall, a second upper side wall, a bottom wall, and end walls forming a chamber for holding roughage feed, said bottom wall including an arcuate longitudinal trough section canted about a longitudinal axis, and first and second upwardly and outwardly inclined sections extending from opposite sides of the trough section, said first and second inclined sections merging at their upper ends respectively into said upper side walls, an auger located in the chamber adjacent to said trough section, said auger having a longitudinally extending shaft between said end walls and helical flight means secured to said shaft, said helical flight means having an outer edge, means rotatably horizontally mounting said shaft on said end walls for rotation about the longitudinal axis of said shaft, said trough section and said first inclined section of said bottom wall defining therebetween a longitudinal break line extended continuously between said end walls, said break line being located in a horizontal plane intersecting the longitudinal axis of the shaft and in close adjacent relationship with the outer edge of said helical flight means, said canted trough section located in close adjacent relationship with the outer edge of said helical flight means and extending from said break line through an arc on the order of 135 degrees to merge with said second inclined section, said outer edge of the helical flight means being uniformly spaced inwardly from the break line along the horizontal plane intersecting the longitudinal axis of the shaft, said trough section being spaced radially outward a small and uniform distance from the outer edge of the helical flight means whereby roughage feed does not wedge between the helical flight means and the break line and helical flight means and the trough section, said second inclined section extending generally tangentially from said trough section at a location below said horizontal plane of the auger shaft axis, means to rotate said auger in a direction so that a first lateral portion of the auger moves downwardly past said break line toward said trough section and a second lateral portion thereof opposite the first lateral portion moves upwardly away from said trough section and from said second inclined section, and a discharge opening through said tangential second inclined section through which feed is discharged by the rotating auger.

4,373,846
PANEL TRANSFERRING APPARATUS

Carl D. Charbonnet, 4800 Divison Ave., Birmingham, Ala. 35222

Filed Oct. 24, 1980, Ser. No. 200,417
Int. Cl.³ B65G *1/06*
U.S. Cl. 414—331 **1 Claim**

1. Apparatus for transferring panel-like members selectively from a supporting cage in which the panel-like members are supported in vertically spaced relation to each other with the apparatus including an elongated reciprocable bar-like member carried by a supporting frame, the improvement comprising:

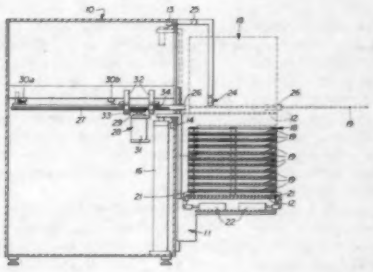
(a) a horizontal, movable plate-like member detachably connected to the lower end of said cage,

(b) a hydraulic cylinder mounted within the confines of said supporting frame in laterally spaced relation to said cage and connected to said plate-like member for moving said cage upwardly and sequentially through a series of movements to selected vertical positions and downwardly to a lowermost position,

(c) a proximity sensor operatively connected to said cylinder and carried by said supporting frame in position to sense the upper surface of the uppermost panel-like member carried by said cage and limit upward vertical movement of said cage in response to movement of each said uppermost panel-like member to a predetermined uppermost position with each successive upward movement of said cage placing said uppermost panel-like member carried therein in said predetermined uppermost position and in alignment with said bar-like member,

(d) a first limit switch limiting upward movement of said cage to an uppermost position,

(e) a second limit switch limiting downward movement of said cage to said lowermost position,



(f) a pinion drive unit carried by said frame and engaging an elongated rack carried by said bar-like member with said pinion drive unit and said rack imparting horizontal rectilinear movement to said bar-like member selectively to a retracted position with the outer end of said bar-like member being inwardly of the adjacent edge of said uppermost panel-like member and to an extended position to eject said uppermost panel-like member from said cage,

(g) at least one pair of oppositely disposed and vertically spaced roller-like members carried by said frame in position to engage the upper and lower surfaces of said bar-like member and limit vertical movement thereof upon movement of said bar-like member to and from said extended position so that said bar-like member travels in a rectilinear direction above and out of engagement with the panel-like member subjacent thereto,

(h) at least one pair of oppositely disposed and laterally spaced roller-like elements carried by said frame in position to engage said bar-like member and limit lateral movement thereof, and

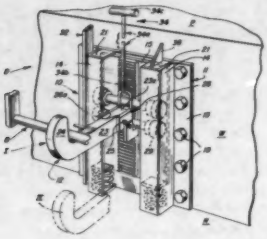
(i) stop means carried by said frame and operatively connected to said pinion drive unit for limiting movement of said bar-like member to said extended position and to said retracted position.

4,373,847

RELEASABLE LOCKING DEVICE

Steven J. Hipp, Milwaukee, and Norbert Hahn, Cudahy, both of Wis., assignors to Rite-Hite Corporation, Cudahy, Wis.

Filed May 4, 1981, Ser. No. 260,340
Int. Cl.³ B60R 9/06; B60D 1/00
U.S. Cl. 414—401 **13 Claims**



13. A releasable locking device for securing a parked vehicle to an adjacent upright structure, said device comprising a first means having a first member fixedly mountable on the structure and a second member mounted on said first member for limited substantially vertical relative movement, said second member being upwardly biased to assume a normal rest position; second means mounted on said first means for substantially vertical movement relative thereto between operative and inoperative modes, the location of said second means when in an inoperative mode being a predetermined distance beneath the location of said second means when in an operative mode; and third means for releasably retaining said second means in an operative mode, said third means having a first element carried by the second member of said first means, and a complemental second element carried by said second means, said first and second elements coacting with one another to prevent movement of said second means from an operative mode to an inoperative mode; said second means including a first section projecting outwardly from said first means, one end of said first section being connected to said first means and being guided thereby for selective relative movement in a predetermined substantially vertical path, and a second section extending angularly upwardly from said first section and being spaced outwardly from said first means, said second means, when in an operative mode, being adapted to interlockingly engage a portion of the parked vehicle disposed intermediate the second section and said first means; said second means, when in an inoperative mode, being adapted to be in a nonlocking relation with the parked vehicle; the second member of said first means being movable downwardly from the normal rest position only when a depressive external force exerted on said second means, while the latter is retained in an operative mode, exceeds the biasing force applied to said second member.

4,373,848

METHOD AND APPARATUS FOR EXPOSING CONTENTS OF AN OPENED ENVELOPE WITH GRAVITY ASSIST

Cliff Bishop, Elmhurst, Ill., assignor to AES Technology Systems, Inc., Elk Grove Village, Ill.

Filed Sep. 22, 1980, Ser. No. 189,227
Int. Cl.³ B65G 65/00
U.S. Cl. 414—403 **4 Claims**

1. An apparatus for closing opened, emptied envelopes wherein each envelope has first and second panels separated from each other along all but one straight edge portion where the panels remain connected and wherein the first and second panels are opened and lie on opposite sides of said connected edge portion, said apparatus comprising:

(a) means for moving said empty envelopes along a path seriatim with said first and second panels positioned on opposite sides of said connected edge portion and with said first panel trailing said second panel;

(b) deflecting means in said path for presenting a deflecting surface against which said second panel impinges and moves upwardly along;

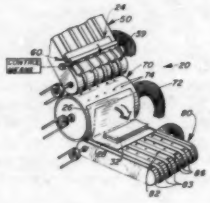
(c) abutment means below sad deflecting means for presenting an abutment surface against which said connected edge portion and said first panel fall and slide downwardly along; and

(d) rotating roller means, adjacent said deflecting means and said abutment means, for engaging said second panel and propelling said envelope along said abutment surface to close said first and second panels.

4. An apparatus for exposing the contents of an envelope which has first and second opposing panels wherein the panels have been separated from each other along all but one straight edge portion where the panels remain connected, said apparatus comprising:

(a) continuously operating first moving means for moving said envelope along a first path, said first moving means including continuously moving first conveyor means and first means for reducing the pressure at the surface of said first conveyor means when said envelope is on said first conveyor means whereby said envelope is held against said first conveyor means by the pressure differential between the ambient atmospheric pressure and the reduced air pressure under portions of said envelope on said first conveyor means;

(b) aligning means along said first path for temporarily interrupting the movement of said envelope along said first



path and for aligning said envelope relative to said first path with said one straight edge portion aligned generally perpendicular to the direction of movement of the envelope along said first path;

(c) control means responsive to the presence of said envelope in said first path for effecting actuation of said aligning means to allow said continuously operating first moving means to move said envelope further along said first path;

(d) tilting means at the end of said first moving means for receiving said envelope from said first moving means and for gripping said first panel of said envelope and for tipping said envelope to orient the connected edge portion of the envelope below the rest of the envelope to permit the ungripped second panel to fall away from the gripped first panel under the influence of gravity, said tilting means including a generally cylindrical member oriented with the longitudinal axis generally normal to the direction of movement of the envelope along said first path on said first moving means, said cylindrical member having an interior chamber portion and defining in the exterior surface of the member a plurality of apertures communicating with the interior chamber portion, said tilting means further including means for reducing the pressure within said interior chamber of said cylindrical member whereby said envelope first panel is held against said cylindrical member by the greater ambient air pressure, and in which said tilting means includes means for rotating said cylindrical member to move at least said gripped

panel of the envelope in a locus defined by a portion of a circular arc with the connected edge portion of the envelope leading the movement of the envelope in said locus; and

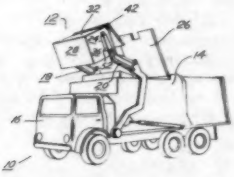
(e) continuously operating second moving means adjacent said tilting means for receiving said ungripped second panel as it falls away from said first panel and for moving said envelope along a second path away from said tilting means to move said first panel off of said tilting means onto said second moving means with the first and second panels opened and lying in said second path on opposite sides of said connected edge portion with the envelope contents thereby exposed on top of at least one of said first and second panels, said second moving means being disposed relative to both said first moving means and said cylindrical member so as to result in said cylindrical member being located between said first and second moving means, said second moving means including continuously moving second conveyor means and second means for reducing the pressure at the surface of said second conveyor means when said envelope is on said second conveyor means whereby said envelope is held against said second conveyor means by the pressure diferential between the ambient atmospheric pressure and the reduced air pressure under portions of said envelope on said second conveyor means.

4,373,849

REFUSE CONTAINER LIFT POCKET

Jimmie R. Robinson, Silver Lake, Ind., assignor to Flint & Walling, Inc., Silver Lake, Ind.

Filed Jul. 24, 1980, Ser. No. 171,751
Int. Cl.³ B65F *3/04*
U.S. Cl. 414—408 **6 Claims**



1. In combination with a vehicle having lift arms having horizontal upper surfaces and being forwardly movable on a horizontal plane, and a refuse container of the type which is lifted and inverted by a refuse collecting truck for emptying the refuse contained therein and which has a front wall, a back wall, end walls therebetween, a floor, and a hinged lid: a lift pocket mounted on and projecting outwardly from the outside surface of each end wall, each pocket having opposite open ends and a top plate, a bottom plate and a side plate joined to the outer edges of the top and bottom plates, said top plate sloping downwardly toward the rear end of the pocket relative to the horizontal upper surface of said arm, for initial engagement at said rear end by said horizontal upper surface of said arm for supporting and tilting the container toward the truck as the container is lifted for inversion to remove the refuse therefrom.

4,373,850

AUTOMATIC FUEL CONTROL SYSTEM

M. E. Durham, 4 Rangeview Cir., Greenville, S.C. 29611

Filed Feb. 14, 1980, Ser. No. 121,633
Int. Cl.³ E02F *3/74*
U.S. Cl. 414—699 **6 Claims**

1. A system for automatically regulating the fuel supplied to an engine of a mobile construction machine including a hydraulic pump driven by said engine, a tool carried by said machine for performing work functions, at least one hydraulic cylinder for manipulating said tool responsive to pressurized fluid being supplied to said hydraulic cylinder from said hydraulic motor, a reservoir of hydraulic fluid, hydraulic lines providing communication between said reservoir, hydraulic motor and said hydraulic cylinder, a manually operated valve mechanism for controlling the flow of hydraulic fluid between said hydraulic pump and said hydraulic cylinder, and a lever arm for regulating the flow of fuel to said engine, the improvement comprising:

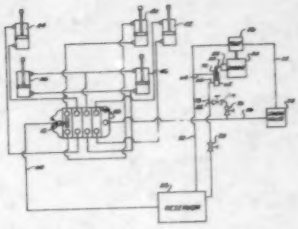
a double action cylinder having:

(i) fluid ports adjacent opposed ends of said cylinder;

(ii) a piston carried in said double action cylinder;

(iii) a piston rod carried by said piston extending out of one end of said cylinder;

means connecting said piston rod to said lever arm for moving said lever arm responsive to the movement of said piston in said double action cylinder;



a hydraulic line connected between said valve mechanism and said hydraulic pump and one of said fluid ports of said double action cylinder for shifting said piston responsive to movement of said manually operated valve mechanism;

bypass openings provided in said double action cylinder for allowing a bleed-through of fluid from one side of said piston to the opposed side for minimizing the response time for movement of said piston responsive to pressurized hydraulic fluid being supplied to said hydraulic cylinder;

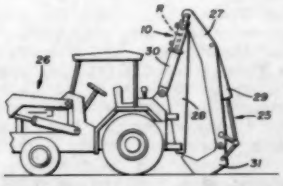
whereby said piston causes said lever arm to be moved for regulating the flow of fuel to said engine responsive to the flow of hydraulic fluid being supplied to said hydraulic cylinder.

4,373,851

BULLDOZER AND BACKHOE LOCK DEVICE

Richard J. Confoey, 15846 Heiser Rd., Berlin Center, Ohio 44401

Filed Oct. 9, 1980, Ser. No. 195,376
Int. Cl.³ B66F *9/20*; F15B *15/26*
U.S. Cl. 414—722 **2 Claims**



1. A locking device for use on a piston rod of a hydraulic piston and cylinder assembly of a bulldozer, tractor, backhoe, and the like arranged to hold an implement thereof in an extended position and comprising a cylindrical sleeve of a length to fit said piston rod in its extended position, said cylindrical

sleeve consisting of a pair of sleeve halves having oppositely disposed longitudinally extending meeting edges, half circular portions of an annular flange on one end of said sleeve halves of a diameter greater than the diameter of the cylinder of said piston and cylinder assembly, means hinging said sleeve halves to one another and secondary means for locking said sleeve halves to one another, oppositely disposed outwardly extending solid arms on the other end of said cylindrical sleeve arranged to cover pivoted portions including the pivot of said bulldozer, tractor, backhoe and the like.

4,373,852

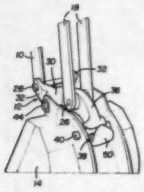
QUICK COUPLING AND RELEASE MECHANISM FOR BUCKETS

Herman J. Maurer, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 6, 1981, Ser. No. 280,654

Int. Cl.³ E02F *3/70*

U.S. Cl. 414—723 **3 Claims**



1. A quick attachment and release mechanism for attaching a bucket to a loader scoop arm having extensible and retractable push-pull links operatively attached thereto, said mechanism comprising:

a quick coupler pivotally mounted to one end of said scoop arm for receiving various types and sizes of buckets, said quick coupler having a three leg configuration including a hub, a pair of spaced apart depending legs pivotally mounted to opposite sides o said scoop arm end, and a third leg extending from said hub in a cantilevered fashion, said third leg having a slotted end for selective engagement with a mounting pin on said bucket, said push-pull links pivotally connected at one end to said quick coupler third leg and said hub being pivotally attached to attaching points on said bucket by a releasable mounting pin.

4,373,853

LOG HANDLING MACHINE

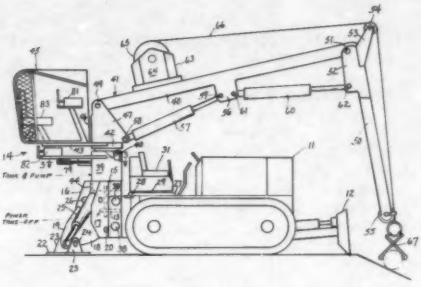
Cleveland J. Biller, and Benjamin C. Thorner, both of Morgantown, W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 23, 1980, Ser. No. 171,625

Int. Cl.³ B66C *23/00*; B60D *1/02*

U.S. Cl. 414—732 **12 Claims**

1. A self-contained log handling attachment for use with a self-propelled vehicle, said vehicle comprising power take-off means, said attachment comprising self-contained hydraulic pump means, means to connect said hydraulic pump means to said vehicle power take-off means, said hydraulic pump means supplying power for substantially all functions of said attachment, said attachment comprising supporting bracket means, means to rigidly secure said supporting bracket means to the rear portion of the vehicle, whereby the rest of said attachment is readily mounted and dismounted on and off said supporting bracket means on said vehicle without affecting said vehicle's normal operating abilities, upstanding boom support means vertically journalled on said supporting bracket means, means to adjustably rotate said boom support means relative to said supporting bracket means to selected angular positions covering a full 360° circle of said attachment about a substantially vertical axis of rotation of said support relative to said supporting bracket means, an articulated boom assembly pivotally connected to the upper portion of said upstanding boom support means, an operator's cab mounted on said attachment for rotation together with said articulated boom assembly, said supporting bracket means providing a substantially rigid connection of said log handling attachment to said vehicle such that said log handling attachment can operate in all positions in said 360° circle of rotation; and said rigid connection and the weight of said vehicle adding together and acting to increase the load handling capability of said log handling attachment



when said log handling attachment is substantially axially aligned and overhead with respect to said vehicle; means in said cab for controlling all functions of said attachment, winch means mounted on said articulated boom assembly adjacent said upstanding boom support means, cable guide means on said articulated boom assembly, said cable guide means comprising a cable guide pulley rotatably mounted at a hinge portion of said articulated boom assembly, said winch means having a cable engaged over said cable guide pulley, log-engaging tool means connected at the end of said cable, and said cable guide means further comprising a shielded end guide pulley at the end of said articulated boom assembly.

4,373,854

WARP BEAM INSERTION CARRIAGE

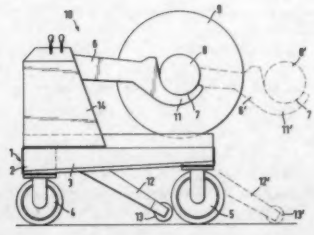
Hans-Werner Schultheis, Kunzell, Fed. Rep. of Germany, assignor to Hubtex Maschinenbau GmbH, Petersberg, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,742

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935624

Int. Cl.³ B60P *1/20*

U.S. Cl. 414—742 **8 Claims**



1. A carriage for inserting warp beams into a weaving machine and for effecting movement of a warp beam with respect to a generally horizontal support surface, the warp beam having an axis extending from end-to-end of the warp beam, the

warp beam also having a journal extending from the ends thereof, the carriage comprising:

a frame, one side of which is for facing the weaving machine, the other side of which is for facing away therefrom;

guide rollers on said frame, said guide rollers supporting said frame on the support surface to permit movement of said frame relative to the support surface;

a plurality of support arms coupled with said frame for supporting the warp beam, said support arms having front ends for engagement with the journal of the warp beam; said front ends of said support arms being adapted to be raised or lowered with respect to the horizontal support surface;

means for displacing said front ends of said support arms with respect to said frame in a displacement path which is transverse to the axis of the warp beam and in a forward direction, said forward direction running in a direction generally from said other side toward said one side of said frame;

said front ends of said support arms being movable, by said displacing means, from a retracted position with respect to said frame to an outermost extended position with respect thereto, such movement from said retracted position to said extended position being in said forward direction;

supports coupled with said frame and movable with said support arms in a path generally parallel to said displacement path, said supports being disposed vertically below said front ends of said support arms and being in engagement with the support surface when said front ends of said support arms are in said outermost extended position;

said supports being formed by jibs extending from said frame generally in said forward direction but at a downward incline with respect thereto; and

a guide rail on said frame for guiding the movement of said jibs, said guide rail extending in a forward direction at a downward incline with respect to the horizontal.

4,373,855

TOOL CARRIER UNIT MOVABLE OVER A TUBE-PLATE

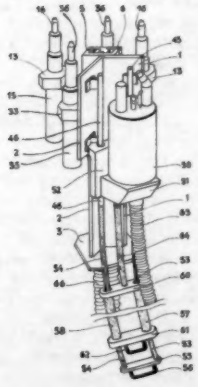
Bernard Lebouc, Dinan, France, assignor to Framatome, Courbevoie, France

Filed May 30, 1980, Ser. No. 154,864

Claims priority, application France, May 31, 1979, 79 14020

Int. Cl.³ F28G *15/08*; B25S *9/00*

U.S. Cl. 414—744 R **3 Claims**



1. A tool carrier unit movable over a tube plate comprising:

(a) a supporting element in the form of an angle bracket defining a vee, the apex of said vee being, in use, perpendicular to said tube plate;

(b) two slides mounted on said supporting element;

(c) a carriage mounted on each slide for movement in a direction perpendicular to said tube plate;

(d) two perpendicular arms, each mounted on a respective said carriage for movement in a direction parallel to said tube plate;

(e) remotely controllable devices for engaging in holes in said tube plate mounted on said arms;

(f) independent remotely controllable means for moving each said arm on its respective carriage and each said carriage on its respective slide to enable said unit to be moved step by step across said tube plate, by successively engaging each of said arms with said tube plate and moving the other said arm while said one arm is engaged;

(g) said supporting element being provided, within the angle defined thereby, and unaffected by movement of said arms with guides for a tool; and

(h) means for moving said tool perpendicularly to said tube plate.

4,373,856

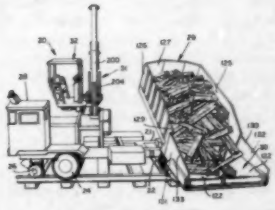
TIE BUTT HANDLER

Glenn E. Taylor, P.O. Box 53006, Atlanta, Ga. 30318

Continuation-in-part of Ser. No. 27,807, Apr. 6, 1979, abandoned, which is a continuation of Ser. No. 833,795, Mar. 6, 1978, abandoned, which is a continuation of Ser. No. 694,925, Jun. 11, 1976, Pat. No. 4,077,328. This application Oct. 2, 1979, Ser. No. 81,210

Int. Cl.³ B60P *1/54*

U.S. Cl. 414—470 **12 Claims**



8. A load carrying vehicle comprising a vehicle framework, road wheels, means for mounting said road wheels on said vehicle framework for movably supporting said vehicle from a road surface, a dump body pivotally mounted on said vehicle framework about a first approximately horizontal axis and rotatably mounted on said vehicle framework about an approximately vertical axis, means for tipping said dump body from a down position upwardly about said horizontal axis and for rotating said dump body about said vertical axis, said dump body including a bottom pan and opposed sidewalls extending upwardly from said bottom pan and defining a rear opening for dumping its load, railroad wheels, retractable means for mounting said railroad wheels on said vehicle framework for lifting said railroad wheels with respect to said framework and for lowering said railroad wheels to engage the rails of a railroad track and supporting the vehicle on the rails of the railroad track, whereby the dump body is rotatable about is upwardly extending axis for guiding the load of the dump body out to the side of the rails of the railroad track when the dump body is tilted, a crane assembly mounted on said framework at a position adjacent the front wall of said dump body when said dump body is aligned with said framework, said crane assembly comprising a boom mounted at one of its ends on said framework and pivotable about an upright axis at its said one end with respect to said framework, a jib lever pivotably mounted at one of its ends to said boom, grasping means mounted at the other end of said jib lever, an operator's station on said framework at said crane assembly, and means for moving said one end of said boom and said operator's station from a position beyond one side to a position beyond the other side

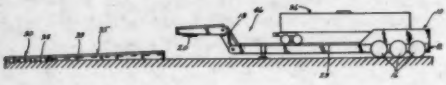
of said framework which enables the said grasping means to retrieve objects next adjacent the vehicle when the vehicle is mounted on a railroad track.

4,373,857

METHOD FOR TRANSPORTING BULK FLUID OR PARTICULATE MATERIAL

William L. Giles, Des Moines, Iowa, assignor to Ruan, Incorporated, Des Moines, Iowa

Filed Jul. 14, 1980, Ser. No. 168,109
Int. Cl.³ B60P 3/07
U.S. Cl. 414—786 6 Claims



1. The method of transporting fluid or particulate material, comprising,

providing a truck-trailer unit including a wheeled frame means having a folding gooseneck apparatus at the forward end thereof and elongated track means extended over the substantial length of said frame means and gooseneck apparatus,

aligning said truck-trailer unit with a railroad track having a railroad car thereon,

folding said gooseneck apparatus to a substantially horizontally disposed position,

loading said railroad car onto the truck-trailer unit by rolling said railroad car from said railroad track onto said elongated track means of said substantially horizontally disposed gooseneck apparatus and onto said frame means rearwardly of said gooseneck apparatus,

folding said gooseneck apparatus to a normal position in a goose neck configuration,

connecting a prime mover to said normally positioned gooseneck apparatus,

transporting said railroad car over land by said truck-trailer unit to the source of said material,

loading said railroad car with said material while said railroad car is on said truck-trailer unit,

transporting said loaded railroad car over land to a rail terminal by said truck-trailer unit,

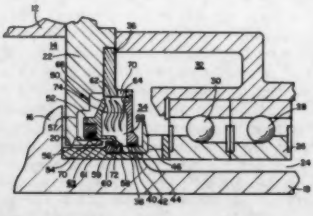
and unloading said loaded railroad car from said truck-trailer unit at said rail terminal for subsequent rail transportation.

4,373,858

FLOW REGULATING SHAFT SEAL FOR AN AIR MOTOR

James M. Eastman, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1980, Ser. No. 214,902
Int. Cl.³ F01D 11/04
U.S. Cl. 415—112 7 Claims



1. In a pneumatic motor having rotor means with shaft ends that extend through openings in a housing, said rotor means being moved by a supply of hot fluid under pressure to develop an output torque, said shaft ends having a predetermined clearance with said openings to allow for dimensional changes resulting from thermal differential expansion caused by the operational hot fluid, said predetermined clearance establishing flow paths through which hot fluid escapes into the surrounding envirionment, the improvement comprising:

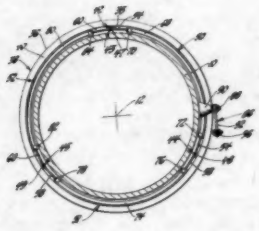
valve means in each opening having a movable wall which surrounds said shaft end, each movable wall having a flange that extends into an adjacent flow path, a land on each shaft end, and resilient means connected to said housing for urging said movable wall toward said land, said hot fluid acting on said flange to produce an operational force which overcomes said resilient means and limits the flow of hot fluid to the surrounding environment through a variable orifice defined by the relationship between said flange and land to retain the hot fluid in the housing.

4,373,859

UNISON RING SUPPORT SYSTEM

Glenn W. Thebert, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 23, 1981, Ser. No. 304,963
Int. Cl.³ F01D 17/16
U.S. Cl. 415—159 3 Claims



1. In a turbomachine having a casing and a stage of adjustable vane assemblies disposed on said casing, each of said vane assemblies including a vane rotatable on said casing and an actuator arm attached to said vane for unitary rotation therewith, the combination comprising, a rigid unison ring disposed in a transverse plane of said casing perpendicular to a longitudinal axis of said turbomachine, connecting means between said unison ring and each of said actuating arms operative to effect pivotal movement of said actuating arms and rotation of said vanes in unison with and in response to rotation of said unison ring about said longitudinal axis while permitting relative radial thermal growth between each of said actuating arms and said unison ring during temperature changes incident to operation of said turbomachine, a plurality of angularly spaced attachment nodes exceeding two in number on said unison ring, a corresponding plurality of push-pull elements capable of force transmission only lengthwise, each of said push-pull elements having a first end pivotally connected to one of said attachment nodes and a second end pivotally connected to the one of said attachment nodes to which said first end of the next succeeding push-pull element is attached, and a corresponding plurality of sheath members each slidably receiving a respective one of said push-pull elements and having rigid attachment at opposite ends to said casing, each of said sheath members directing said first and said second ends of a corresponding one of said push-pull elements generally tangent to a circle in said transverse plane about said longitudinal axis so that said plurality of push-pull elements resist displacement of said unison ring in said transverse plane from centered relationship about said longitudinal axis independently of said bearing means with net

forces on said attachment nodes directed generally tangent to said circle.

4,373,860

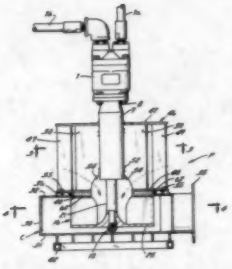
SUBMERSIBLE HYDRAULIC PUMP OF THE AXIALLY DIRECTED INLET AND TANGENTIAL OUTLET TYPE

Albert H. Sloan, 4200 Kean Rd., Fort Lauderdale, Fla. 33314

Filed Dec. 24, 1980, Ser. No. 291,889

Int. Cl.³ F04D *1/00*

U.S. Cl. 415—185 **9 Claims**



1. A submersible hydraulic pump assembly comprising a generally volute pump casing having two opposed sides, a fluid outlet extending generally tangentially from said pump casing, said casing having an axially central opening in one of said sides for the axial passage of water into said pump casing, a pump impeller located and rotatable in said casing and having a shaft fixed thereto and extending out of said casing through said central opening, a power source on said one of said sides of said pump casing and having a driving connection with said shaft for rotating said pump impeller to cause water to form as a vortex adjacent said one side and opening when said water flows into said central opening and thereby forms a central void of substantially no water pressure in said vortex, and bearing means for rotatably supporting said shaft, said bearing means mounted adjacent said one side and located outside of said casing and adjacent said central opening and in said void to prevent leakage of water into said bearing means.

4,373,861

AXIAL-FLOW FAN

Georg F. Papst; Siegfried Harmsen, both of St. Georgen, and Günter Wrobel, Villingen, all of Fed. Rep. of Germany, assignors to Papst-Motoren KG, Georgen, Fed. Rep. of Germany

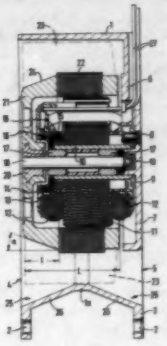
Filed Apr. 16, 1980, Ser. No. 140,883

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940650

Int. Cl.³ F04D *25/08, 29/44*

U.S. Cl. 415—213 C **12 Claims**

1. An axial-flow fan comprising a fan wheel and a housing casing surrounding said fan wheel over at least substantially the entire axial length of said fan wheel, the fan wheel having a hub with a diameter which is at least half as large as the inner diameter of the housing casing wherein said housing casing is cylindrical in the axial central part and is broadened at least toward the exhaust side by way of corner pockets formed by essentially smooth walls into a square profile circumscribing the diameter of the fan wheel, said hub of the fan wheel being provided on the inlet side with an annular surface which extends approximately over one-third of the entire axial length of



said hub and which has a conical configuration toward the end face.

4,373,862

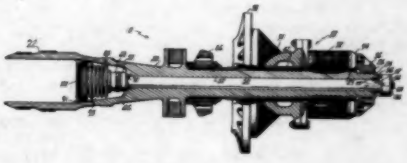
ROTOR BLADE SHAFT INTEGRITY MONITORING SYSTEM

Donald L. Ferris, Newtown, and Peter C. Ogle, Woodbridge, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1981, Ser. No. 315,125

Int. Cl.³ B64C *11/16, 27/48*

U.S. Cl. 416—61 **7 Claims**



1. A helicopter rotor including a hub member mounted for rotation about an axis of rotation and having at least one hub arm and related helicopter blade projecting substantially radially therefrom for rotation therewith and an improved spindle assembly comprising:

a hollow spindle shaft extending radially from within the hub arm and outwardly therebeyond and having a radial inner end, a radial outer end and a central bore extending the full length of said shaft, said radial outer end shaped to define an enlarged chamber contiguous with the spindle bore and being adapted to be operatively connected to a helicopter blade,

bearing means operatively connecting the spindle shaft inner end to the hub arm and operative so as to support said spindle shaft and hence the blade from the hub so that blade centrifugal loading during rotor operation will be passed through said spindle shaft and said bearing means to said hub,

a thru-bolt extending through the spindle shaft bore for the full length thereof and having an inner end comprising a bolt head abutting said spindle inner end and having an outer end extending beyond the radially outer end of the shaft bore and into said spindle outer end enlarged chamber, said thru-bolt having an outer diameter selectively smaller than the spindle shaft bore so as to define a substantially annular chamber therebetween extending for substantially the full radial dimension of said bore,

means to operatively connect the thru-bolt outer end to the spindle shaft outer end to serve as a redundant centrifugal load path in the event of spindle shaft failure,

means to seal opposite ends of said annular chamber adjacent the radial inner and outer ends of the spindle bore, and

means to provide fluid dye under pressure into said sealed annular chamber so as to escape through any crack which might develop in the spindle shaft wall and then be aided by centrifugal force to flow along the outer surface of the spindle shaft to an area external of the hub arm for visual detection.

4,373,863

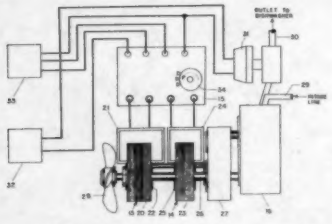
FEED CONTROL SYSTEM FOR PUMPING FLUIDS TO DISHWASHERS AND THE LIKE

William L. Mason, 24782 Calle Vinetos, El Toro, Calif. 92630, and William K. Russell, 2715 Sparrow Cir., Costa Mesa, Calif. 92626

Continuation-in-part of Ser. No. 14,041, Feb. 22, 1979, Pat. No. 4,242,051. This application Sep. 29, 1980, Ser. No. 191,710

Int. Cl.³ F04B *49/00, 49/02*

U.S. Cl. 417—12 **11 Claims**



1. A feed control system for pumping fluids having linear shear rates and non linear shear rates, separately and to-gether, comprising:

a. a peristaltic pump for feeding detergent to the dishwasher;

b. an A.C. shaded pole motor for driving the pump, control for actuating the A.C. motor including:

I. a probe for determining concentration of the detergent; and,

II. a turn on circuit actuated by the probe, comprising:

i. an A.C. power supply;

ii. means for pre-setting the turn on circuit for response ta a specific detergent concentration;

iii. a turn on switch for admitting pulses from the probe;

iv. a first bilateral switch for turn on upon actuation by the power supply and pulses from the turn on switch;

v. solenoid means for turning on the dishwasher when the bilateral switch is turned on;

vi. detector means for converting signals from the bilateral switch to a pulse train;

vii. a clock counter for providing pulse signals;

viii. an adjustable timing counter set for correspondance to detergent feed time;

ix. gating means for receiving pulses from the detector means, clock counter and timing counter;

x. a second bilateral switch for turn on by the gating means and A.C. power supply when the probe indicates an excessive detergent feed time determined by setting of the timing counter;

xi. alarm means for actuation by the second bilateral switch;

c. a variable speed, D.C. powered shaded pole motor connected to the A.C. motor, and acting as an electromagnetic brake on the A.C. motor; and,

d. an A.C. to D.C. rectifier for supplying D.C. power to the variable speed motor;

the peristaltic pump being driven by the A.C. motor, whereby a decrease in viscosity of the fluid causes a decrease in rotational force to the constant torque motor and a counterbalancing increase in braking power of the variable speed motor, thereby linearizing the flow of fluid to the peristaltic pump.

4,373,864

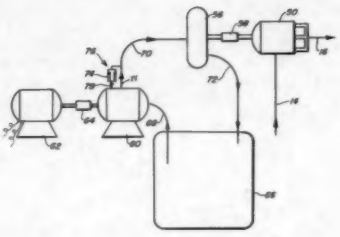
SYSTEM FOR PUMPING FLUIDS AT CONSTANT PRESSURE

Lester G. Massey, Moreland Hills, Ohio; Robert I. Brabets, Lombard; William A. Abel, Joliet, both of Ill.; James K. Anderson, Gary, Ind.; Thomas J. Labus, Downers Grove, and Davis A. George, Park Forest, both of Ill., assignors to CNG Research Company, Cleveland, Ohio

Filed Mar. 6, 1980, Ser. No. 127,738

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—46 **9 Claims**



1. A pump system for pumping a first fluid at a substantially constant pressure regardless of fluid flow rate, said system comprising in combination:

(a) a pump for said first fluid, said pump having a first fluid inlet, a first fluid outlet and means for pumping the first fluid from the inlet through the outlet;

(b) a fluid motor for directly and mechanically driving the means for pumping; and

(c) adjustable means for driving the fluid motor, said adjustable means including means for sensing the relative pressure drop across the fluid motor and for adjusting the torque output of the fluid motor in inverse relationship to the pressure drop across the fluid motor such that the first fluid is pumped at a substantially constant pressure regardless of fluid flow rate.

4,373,865

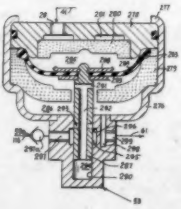
RECIPROCATING CONTROLS OF A HYDRAULICALLY DRIVEN PISTON GAS COMPRESSOR

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Filed Feb. 10, 1981, Ser. No. 233,219

Int. Cl.³ F04B *49/00, 3/00, 17/00*

U.S. Cl. 417—46 **6 Claims**



1. A compressor drive system comprising gas compression piston means provided with compressed gas outlet means, and hydraulic drive means operable to transmit a reciprocating motion to said gas compression piston means said hydraulic drive means having hydraulic piston means in sealing engage-

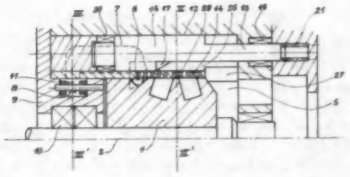
ment with bore means defining first and second chambers, a pump having a discharge outlet, exhaust means, and control means operable to sequentially connect said first and said second chamber with said discharge outlet and said exhaust means at the end of each compression stroke said control means having means responsive to pressure in said discharge outlet and means responsive to pressure in said compressed gas outlet means, and gas pressure to hydraulic pressure signal translating means interposed between said compressed gas outlet means and said control means and having hydraulic fluid replenishing means communicable with said discharge outlet.

4,373,866

PROCESS TO CONTROL THE DELIVERY OF A SINGLE SCREW COMPRESSOR

Bernard Zimmern, Neuilly sur Seine, France, assignor to Uniscrew Limited, Hamilton, Bermuda

Filed Jun. 10, 1980, Ser. No. 158,074
Claims priority, application France, Jun. 18, 1979, 79 15484
Int. Cl.³ F04B *49/02;* **F04C** *18/00, 23/00, 29/10*
U.S. Cl. 417—53 **3 Claims**



1. A process to control the delivery of single screw compressors or expansion machines of the type including a screw co-operating with at least two pinion wheels and rotatable inside a casing provided with at least one low pressure orifice and with high pressure orifices located near said pinion wheels, at least one channel to connect the high pressure orifice pertaining to one of the pinion wheels, called first pinion, and the low pressure orifice, such channel being provided with an obturating means, auxiliary orifices arranged in the casing connecting the various zones of the casing exposed to pressure with the low pressure orifice, said auxiliary orifices being provided with obturating devices, such process comprising sequentially opening these orifices to diminish the delivered volume, starting from the orifices located at the lowest pressure and progressing towards the orifices at the higher pressure, the process including the hierarchy of steps wherein, in order to reduce the delivery of the compressor or expansion machine from a maximum delivery, the auxiliary orifices pertaining to the first pinion are first sequentially opened; if then the measured delivery is still too high the device obturating the channel connecting the high pressure orifice of the first pinion and the low pressure orifice is opened secondly; and if then the delivery obtained is still too high the auxiliary orifices pertaining to the second pinion are finally sequentially opened.

4,373,867

PRESSURE CHARGED AIRLIFT PUMP

Gene K. Campbell, Las Vegas, Nev., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

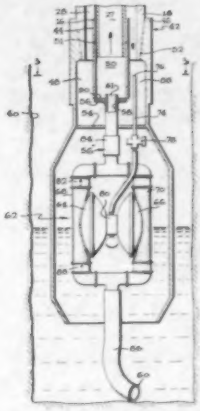
Filed Aug. 15, 1980, Ser. No. 178,653
Int. Cl.³ F04B *23/08, 45/06;* **F04F** *1/20*
U.S. Cl. 417—90 **3 Claims**

1. A compressed gas operated pumping subassembly for attachment onto the end of a dual string drill pipe string having first and second parallel extending concentric conduits, said subassembly capable of removing water, mud and rock bits of moderate size from an underground cavity, said subassembly comprising:

(a) An upper portion having means for connecting the subassembly directly onto the end of the pipe string and extending said first and second conduits, terminating the end of said first conduit in a plenum;

(b) A compressed gas operated diaphragm pump suspended from said upper portion;

(c) A third conduit connecting the discharge of said pump with said second parallel extending conduit for fluid flow thereinto, said second and third conduits presenting essentially no obstruction to the flow of mud and rock bits of moderate size therethrough;



(d) A fourth conduit connecting said plenum to the pump operator for delivering pressurized gas thereto; and

(e) Fifth conduit means connecting said plenum with said second parallel extending conduit whereby compressed gas delivered to said plenum through said first parallel extending conduit operates said pump and aerates the discharge from said pump in said second conduit thereby facilitating the flow of said discharge to the earth's surface.

4,373,868

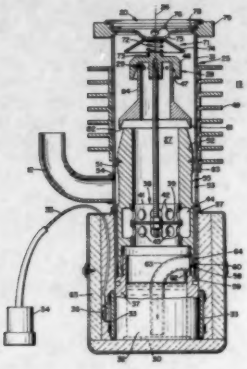
DIFFUSION PUMP FOR LEAK DETECTOR

Arthur A. Landfors, Newton, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 702,654, Jul. 6, 1976, Pat. No. 4,140,438. This application Jan. 17, 1978, Ser. No. 870,234
Int. Cl.³ F04F *9/00*
U.S. Cl. 417—154 **6 Claims**

1. A diffusion pump comprising a body assembly including a cool wall having a longitudinal, centrally located axis, a cylindrical heater for establishing a cylindrical radial thermal gradient, said heater comprising a heating wall coaxial with the body assembly and surrounding a pool of liquid that the heater causes to boil changing its state to vapor, a jet assembly coaxial with the body assembly, means for providing a flow path for the vapor from the surface of the pool to the jet assembly, the jet assembly inducing at least one annular nozzle concentric with the axis for directing the vapor downwardly against the cool wall, the cool wall condensing the vapor striking it into a liquid that flows downwardly along the body assembly toward the pool, and means for providing a flow path for the con-

densed liquid directly from the body assembly to a region substantially at the bottom of the pool and on the axis so that



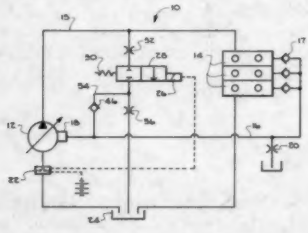
the condensed liquid flows outwardly and upwardly from the bottom of the pool and the axis.

4,373,869

WARM-UP VALVE IN A VARIABLE DISPLACEMENT SYSTEM

Robert J. Martin, Hutchinson; Loren L. Alderson, Nickerson, and Jerry F. Carlin, Hutchinson, all of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Aug. 22, 1980, Ser. No. 180,550
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—213 **11 Claims**



1. A warm-up valve in a system having a variable displacement pressure and flow compensated pump supplying at least one function through at least one directional control valve with a signal sensing line from the control valve to the compensator on the pump, the warm-up valve comprising:

a temperature-actuated servo means sensing the system reservoir temperature;

a valve means positioned in a line connecting the pump discharge to reservoir, said means being actuated by said servo means having a spool which in its first position opens the pump discharge to the pump compensator and allows a controlled amount of the pump capacity to return to reservoir;

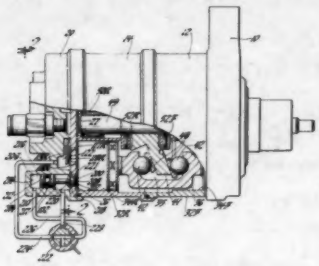
the valve spool having a second position, when actuated by the servo means, which blocks the pump discharge to the pump compensator and to reservoir.

4,373,870

VARIABLE CAPACITY POSITIVE DISPLACEMENT TYPE COMPRESSOR

Richard T. Pandzik, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 17, 1980, Ser. No. 169,598
Int. Cl.³ F04B *1/18, 39/10, 49/02*
U.S. Cl. 417—269 **3 Claims**



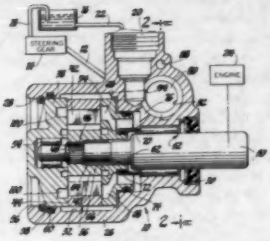
1. In a variable capacity compressor of the positive displacement type having one or more compression chambers each with a suction valve and further having a variable pumping capacity control arrangement wherein the pumping capacity is varied by effecting communication between the compressor's suction side and one or more of the compression chambers during compression: an improved variable capacity control arrangement comprising in combination, a bypass passage connected in parallel with at least one of the suction valves between the fluid supply and the respective compression chamber, bypass valve means operable to open and close said bypass passage, said bypass valve means having a first pressure responsive area acted on by fluid pressure direct from the associated compression chamber through said bypass passage whereby said bypass valve means is urged thereby to open said bypass passage, said bypass valve means further having a second pressure responsive area substantially larger than and facing in a direction opposed to said first pressure responsive area, and control means for alternately communicating said second pressure responsive area with either the suction side in a reduced capacity demand condition or the discharge pressure from the compression chamber to which said bypass passage is connected in a normal capacity demand condition whereby in said reduced capacity demand condition the force exerted on said bypass valve means during compression by the compression chamber pressure acting on said first pressure responsive area substantially exceeds the force exerted by the suction pressure acting on said second pressure responsive area so that said bypass valve means is moved by such force imbalance and thereafter maintained to open said bypass passage and unload the compression chamber to which the bypass passage is connected and, alternatively, in said normal capacity demand condition the force exerted on said bypass valve means by the discharge pressure acting on said second pressure responsive area remains greater than the force exerted by the pressure in the compression chamber acting on said first pressure responsive area so that said bypass valve means is moved by such force imbalance and thereafter maintained to close said bypass passage to establish and maintain the normal pumping capacity of the compression chamber to which the bypass passage is connected except upon compressor start-up whereupon said bypass valve means is moved by a transient force imbalance thereon to momentarily open said bypass passage and unload the connected compression chamber and thereby reduce start-up torque.

4,373,871

COMPACT POWER STEERING PUMP

John H. Christ, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 4, 1981, Ser. No. 260,015
Int. Cl.[3] F04B 49/08; F01C 19/08
U.S. Cl. 417—310 2 Claims



1. A vane type power steering pump comprising a substantially cylindrical housing having a shaft opening at one end and a larger opening at the other end; a shaft extending through said shaft opening and being rotatably supported adjacent one end in said housing; a pressure plate sealingly engaging said housing and being disposed circumjacent said shaft; a vane pump assembly means disposed in said housing axially adjacent said pressure plate and toward the larger opening and having a rotor being drivingly connected with said shaft; a thrust plate disposed axially adjacent said assembly and rotatably supporting the other end of said shaft, said thrust plate sealingly engaging with said housing and cooperating therewith to close the larger opening; locking ring means engaging said housing and said thrust plate to limit the axial movement of the thrust plate in one direction; fluid inlet means formed in said thrust plate for communicating fluid to said assembly; fluid outlet means in said pressure plate for delivering fluid from said assembly; pressure space means formed by said housing and said pressure plate and having a cross-sectional area less than the total cross-sectional area of said pressure plate, said pressure space means being in communication with said fluid outlet means and cooperating with said pressure plate to create an axial pressure loading on said pressure plate in the direction of said assembly and thrust plate to urge said pressure plate, said assembly and said thrust plate against said locking ring means; fluid flow control valve means disposed in said housing transverse to said shaft and having respective portions in communication with said fluid outlet means and said fluid inlet means; and fluid outlet and fluid inlet port means for respectively directing fluid from said pump and delivering fluid to said pump.

4,373,872

NOISE DAMPING DEVICE

Ulrich Kemmner, Sachsenheim; Peter Ringwald, Rutesheim; Hans-Ulrich Mütschele, and Rainer Schillinger, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

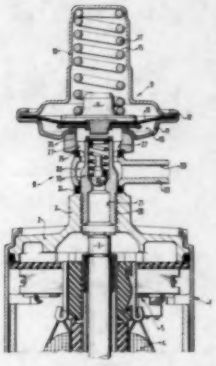
Filed Jun. 26, 1980, Ser. No. 163,119
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933912
Int. Cl.[3] F04B 11/00; F16L 55/04
U.S. Cl. 417—312 7 Claims

1. A noise damping device, which is disposed in a pressurized fluid supply system intermediate an outlet of a fluid supply pump and a pressure line and which is threadingly connected at the pump outlet with an internally threaded compression collar of the pump, for smoothing and reducing pressure fluctuations occuring in the pump, the noise damping device having an axis and comprising:

a diaphragm fluctuation damper including a damper housing and a diaphragm which is disposed within the damper housing and which defines, together with the damper housing, a damping chamber;

a connection extension for connecting the diaphragm fluctuation damper to the pump, having an externally threaded first end which is screwed into the internally threaded pump compression collar and having an opposite second end, the connection extension defining an axial passageway extending between its first and second ends and connecting the pump outlet to the damping chamber;

an annular fitting having an annular-shaped first end through which the connection extension extends and a second end connected to the pressure line, the fitting defining an inner annular groove extending about the connection extension and a flow channel extending from the annular groove to the pressure line;



first and second sealing rings, which extend about the connection extension and which are disposed on one side of the fitting annular-shaped first end facing the damper housing and on an opposite side of the fitting annular-shaped first end facing the pump compression collar respectively; and

a second passageway, which is defined by the connection extension, the fitting annular-shaped first end, the first sealing ring, and the damper housing, and which extends between the damping chamber and the annular groove;

the damper housing being connected to the second end of the connection extension such that rotation of the damper housing about the device axis produces an axial displacement of the damper housing relative to the pump outlet, whereby the annular fitting is fixed in an axial position between the first and second sealing rings by twisting the damper housing in one direction of rotation.

4,373,873

HYDROSTATIC AND OIL WELL PUMP

William M. Kofahl, Rte. 2, Box 297, Licking, Mo. 65542

Filed May 4, 1981, Ser. No. 259,837
Int. Cl.[3] F04B 35/02, 17/00
U.S. Cl. 417—339 11 Claims

1. A pump for pumping a fluid from a first elevation to a second elevation, comprising:

first and second pumping strings extending adjacent the first elevation for carrying a pumping fluid;

an upstroke cylinder slidably mounted on said first pumping string for reciprocating motion between retracted and extended positions;

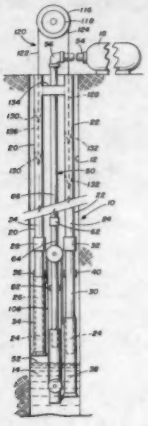
a downstroke cylinder slidably mounted on said second pumping string for reciprocating motion between retracted and extended positions;

a return string extending from the first to the second elevations, said return string having an upper and a lower section interconnected by a one-way valve means for

permitting fluid to flow only from the lower to the upper section;

a pump barrel slidably mounted on said return string for reciprocating motion between extended and retracted positions, said pump barrel and lower section of said return string defining a pumping chamber therebetween varying in volume as said pump barrel moves between the extended and retracted positions, the fluid at the first elevation being permitted to enter the pumping chamber to equalize the fluid pressure therebetween; and

cable means secured between said upstroke and downstroke cylinders, and said pump barrel and engaging sheave means supported in a fixed relation to said return string,



the entry of pumping fluid into said first pumping string at a predetermined pressure urging said upstroke cylinder to the extended position and tensioning said cable means to urge said downstroke cylinder and said pump barrel to the retracted positions, pumping the fluid in the pumping chamber into the upper section of said return string, the entry of pumping fluid at the predetermined pressure into said second pumping string urging said downstroke cylinder to the extended position and tensioning said cable means to urge said upstroke cylinder to the retracted position, said downstroke cylinder and pump barrel having cooperating lug means so that said pump barrel is urged to the extended position by said downstroke cylinder.

4,373,874

FLUID ACTUATED PUMP SYSTEM

Albert Phillips, 465 Kiwanis Ave., Morgantown, W. Va. 26505

Continuation of Ser. No. 62,247, Jul. 30, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,333

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—397 **6 Claims**

1. A control valve comprising,

a unitary valve housing having a bore extending therethrough,

a plurality of fluid inlet and outlet ports extending through said valve housing and communicating with said bore,

a rotatable unitary valve member positioned in said bore,

bearing means for rotatably supporting said unitary valve member in said bore,

said unitary valve member having a plurality of inlet ports and a plurality of outlet ports,

a plurality of internal passages in said unitary valve member for connecting in pairs said inlets with said outlets,

timing means for rotating said unitary valve member at a preselected rate,

said timing means being fluid actuated and including a pair of timing gears positioned in meshing relation in a fluid chamber with one of said timing gears being nonrotatably connected to said unitary valve member so that rotation of said meshing gears rotates said unitary valve member at a preselected rate,

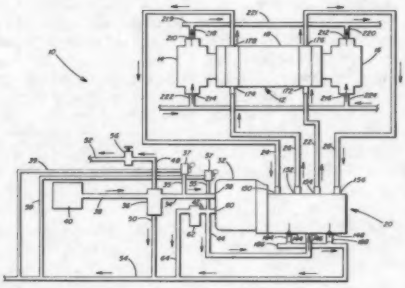
said fluid chamber having an inlet for receiving fluid under pressure from a source and an outlet for conveying fluid under pressure to said unitary valve member such that flow of fluid under pressure from said inlet through said fluid chamber to said outlet rotates said timing gears to rotate said unitary valve member and to convey fluid to said unitary valve member,

said timing gears being rotatable by said fluid flow at a preselected rate to displace a preselected volume of fluid under pressure to control the volume of fluid being conveyed to said unitary valve member,

a fluid circuit connecting said timing gears to a source of fluid and to said unitary valve member for controlling the flow of fluid from the source through said timing means to said unitary valve member,

said fluid circuit including a pilot valve and an operator controllable valve means,

said pilot valve being positioned in said fluid circuit between the fluid source and said timing means and operable to



control the volume of fluid entering said timing means and thereby control the rate of rotation of said timing gears by normally diverting fluid away from said timing means and directing fluid flow from the source to a fluid reservoir,

said operator controllable valve means being positioned in fluid communication with said pilot valve for actuating said pilot valve to direct fluid flow to said timing means and control the volume of fluid conveyed by said timing means to said unitary valve member,

said unitary valve member being arranged upon each revolution thereof to rotate between a first valve position and a second valve position,

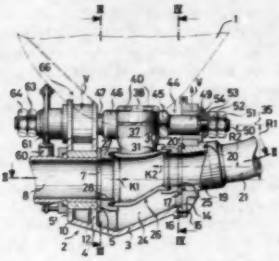
a first set of said valve member inlet and outlet ports in said first valve position being positioned in communication with a first set of said valve housing inlet and outlet ports for directing a preselected volume of fluid upon rotation of said timing gears through said unitary valve member and said valve housing in a first flow pattern, and

a second set of said valve member inlet and outlet ports in said second valve position being positioned in communication with a second set of said valve housing inlet and outlet ports for directing a preselected volume of fluid upon rotation of said timing gears through said unitary valve member and said valve housing in a second flow pattern.

4,373,875
VISCOUS MATERIAL PUMP, IN PARTICULAR FOR THE CONVEYANCE OF CONCRETE

Friedrich Schwing, Herne, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,283
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933128
Int. Cl.³ F04B *15/02*
U.S. Cl. 417—517 **5 Claims**



1. A viscous material pump comprising:

a housing (**3**) receiving the viscous material to be pumped, said housing having a wall containing a conduit opening by which the viscous material is passed from the pump and an opposing wall containing a pair of cylinder openings;

a swivel body (**26**) having a material passage extending between a discharge opening (**32**) and an inlet opening (**28**), the area (A_2) of said discharge opening (**32**) being of a different size than the area (A_1) of said inlet opening, said swivel body being movably positioned in said housing intermediate said opposing walls for alternately connecting the cylinder openings with the conduit opening; and

a swivel shaft (**44**) from which said swivel body extends, said swivel shaft being mounted on said housing for moving said swivel body about an axis of rotation (**35**) extending generally in the direction of the swivel body passage, said discharge and inlet openings of said swivel body being radially displaced from the axis of rotation such that the product of the area (A_2) of the discharge opening (**32**) and the displacement (R_2) of the center of gravity of that area from the axis of rotation is similar to the product of the area (A_1) of the inlet opening (**28**) and the displacement (R_1) of the center of gravity of that area from the axis of rotation.

4,373,876
DOUBLE-ACTING PISTON COMPRESSOR

Akira Nemoto, Toyohashi, Japan, assignor to Musashi Seimitsu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 20, 1980, Ser. No. 161,258
Claims priority, application Japan, Mar. 21, 1980, 55-36645
Int. Cl.³ F04B *39/00, 39/10*
U.S. Cl. 417—534 **5 Claims**

1. An easy-to-assemble, positive-displacement, double-acting compressor comprising:

(a) a housing defining a pair of parallel cylinder chambers laterally open to each other, the housing having a pair of openings formed in its opposite ends;

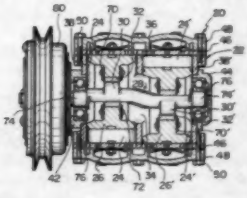
(b) a pair of double-headed pistons reciprocably mounted one in each cylinder chamber, each piston having four side columns extending between two piston heads to form through the piston a first and a second passage arranged crosswise with respect to each other and both extending normal to the axis of the piston;

(c) a crankshaft rotatably mounted in the housing and extending through the first passages in the pistons, the crankshaft comprising a pair of journals at opposite ends thereof, a pair of cranks spaced inboard from the journals, and a pair of outer shaft portions each extending between one of the journals and the adjacent one of the cranks;

(d) a pair of sliders each rotatably fitted over one of the cranks and each reciprocably mounted in the second passage in one of the pistons, the sliders being effective to translate the rotation of the crankshaft into linear reciprocation of the pistons, at least one of said sliders being fitted over one of the cranks, after the pistons are inserted in the respective cylinder chambers and then the crankshaft is passed through the first passages in the pistons to a position at which the crank is in register with the pistons, by inserting the slider into the housing through the opening thereof so as to cause it to lie over the outer shaft portion of the crankshaft and then shifting the slider axially of the crankshaft into the second passage of the piston and onto the crank;

(e) a pair of valve seats closing the opposite ends of the cylinder chambers to define fluid compression chambers between the valve seats and the piston heads;

(f) means forming fluid intake chambers from which fluid is supplied into the fluid compression chambers to be compressed therein; and



(g) means forming fluid discharge chambers outside the valve seats, into which discharge chambers compressed fluid is supplied from the associated compression chambers;

(h) there being the following dimensional relations between the sliders and the other parts of the compressor:

$$A>B,\ C>D,\ E\geq F,\text{ and } G>H$$

wherein

A. is the diameter of each of the openings in the opposite ends of the housing,

B. is the maximum dimension of each slider as measured in a plane normal to its axis,

C. is the dimension of the first passage in each piston as measured in the direction of movement of each slider along the second passage in the piston,

D. is the maximum dimension of each slider as measured in the direction of its movement along the second passage in each piston,

E. is the dimension of the first and second passages in each piston as measured in the axial direction of the piston,

F. is the dimension of each slider as measured in the axial direction of each piston,

G. is the axial dimension of each outer shaft portion of the crankshaft, and

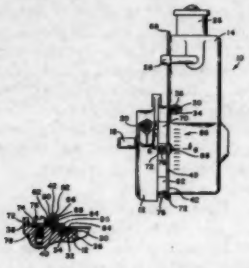
H. is the axial dimension of each slider.

4,373,877

PUMP WITH ROTATABLE RESERVOIR CASING AND INDEX MEANS

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 15, 1980, Ser. No. 186,940
Int. Cl.³ F04C 15/00; B65D 45/04; F16B 2/20
U.S. Cl. 418—2 1 Claim



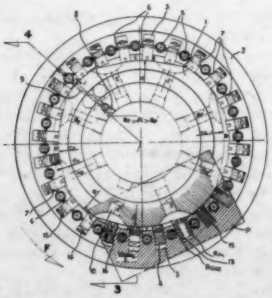
1. In a fluid pump of the type having a body including:
a casing portion defining a fluid reservoir therein and defining a circular opening leading to said reservoir;
a pump housing portion rotatably received in said reservoir and closing said opening;
means for effecting a fluid-tight seal between said body portions; and
means for connecting said body portions; characterized in that said casing portion includes a lip circumscribing at least a part of said opening, said connecting means including a clip having a first part which is U-shaped in cross-section and receiving said lip and a second part extending from said first part, said second part cooperating with said pump housing portion to maintain a selected relative rotational position between said body portions, said casing portion defines a plurality of circumferentially-arranged indicia and said connecting means defines an index so that said selected relative rotational position of said body portions is defined by aligning said index relative said indicia, and said index is defined by said U-shaped first part.

4,373,878

SYNCHRONIZED HYDRAULIC ROTARY CONVERTER AND DISTRIBUTOR DEVICE

Gaston Sauvaget, 6, Allee de l'Oseraie, F-94260 Fresnes, France

Filed Feb. 21, 1980, Ser. No. 123,179
Claims priority, application France, Feb. 22, 1979, 79 04530
Int. Cl.³ F03C 2/00
U.S. Cl. 418—23 14 Claims



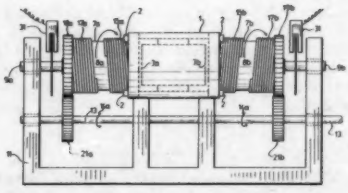
1. In a hydraulic converter distributor device, intended to transform a hydraulic energy into kinetic energy or rotation or vice versa, having a hub stator, said hub stator having an inside diameter of at least 0.5 meter, a rotor in which are radially oriented equidistant grooves, a respective valve received in each of the grooves each of said valve having a lower face which moves on a periphery of the stator and which includes recesses defining swept volumes, conduits coming out in the swept volumes, the valves receiving thrust of drive fluid regulated externally, assuring driving in rotation of the rotor by successively moving in the swept volumes of the stator, and two side flanges mounted on bearings and solid with the rotor closing the device in a fluid-tight manner, the improvement wherein said rotor, said stator and said flanges are of annular shape and constitute a tore of substantially rectangular section of which an average radius of said swept volumes amounts to up to about several meters and whose number is a function of length of the average circumference at magnitude of said average radius total volume of said swept volumes amounting to up to about several hundred liters, and including means for delivering constant drive fluid while allowing for changes of speeds, a 15% variation more or less, means for controlling separately intake of the drive fluid for each of said swept volumes or diametrically opposite pairs of said swept volumes, and means for making at least one of said swept volumes inactive by selective fluid delivery, and wherein said valves are double-acting to both control putting them into action directly by only the pressure of fluid in the active said swept volumes or else recall them to respective bottoms of their housing by a differential pressure (Pi) or adjustable case pressure as a function of needs and putting into operation by an external distributor, idling of said rotor being obtained by making all said swept volumes inactive, and said swept volumes having different depths to thereby define a ratio of the decreasing volume of swept volumes to thereby increase the number of speed ratios available.

4,373,879

ALTERNATING ROTOR MOTOR WITH SPRING CLUTCHES

Rudolf P. Picavet, 2629 Jane St., Downsview, Ontario, Canada

Filed Oct. 26, 1981, Ser. No. 314,758
Int. Cl.³ F01C 1/063; F02B 53/00
U.S. Cl. 418—35 9 Claims



1. A rotary motor comprising a housing, first and second coaxial opposing rotors rotatable within said housing, first and second rotor shafts on which said first and second rotors are mounted respectively, a closed annular rotor chamber which is divided into power, exhaust, intake and compression regions by said rotors, ignition means for fuel combustion in the power region of said annular chamber for rotor rotation, a torque receiving shaft alternately driven by said first and second rotor shafts, a first anti-reversing spring clutch wound on said first rotor shaft and arranged to bind on said first rotor shaft for substantially preventing rotation in a first direction while allowing rotation of said first rotor shaft in a second direction opposite to said first direction, a first movable spring clutch wound around and adapted to bind on and rotate with said first rotor shaft when rotating in said second direction, a second anti-reversing spring clutch wound on said second rotor shaft

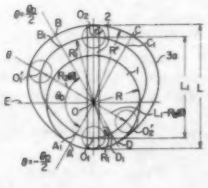
and arranged to bind on said second rotor shaft for substantially preventing rotation in said first direction while allowing rotation of said second rotor shaft in said second direction, a second movable spring clutch wound around and adapted to bind on and rotate with said second rotor shaft when rotating in said second direction and drive means connecting said first and second movable spring clutches to said torque receiving shaft; said first and second rotors being adapted to alternately rotate in said second direction with said movable spring clutches providing, in turn, drive through each rotor shaft when rotating to said torque receiving shaft and providing slippage around each rotor shaft when each rotor shaft is prevented from rotating thereby enabling alternating rotation of said rotors.

4,373,880

THROUGH-VANE TYPE ROTARY COMPRESSOR WITH CYLINDER CHAMBER OF IMPROVED SHAPE

Taro Tanaka, Nagoya; Hideaki Sasaya, and Mitsuo Inagaki, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 4, 1981, Ser. No. 260,210
Int. Cl.³ F04C *18/00*
U.S. Cl. 418—150 **3 Claims**



1. A through-vane type rotary compressor comprising:
housing means having a cylinder chamber therein;
a fluid inlet port and a fluid outlet port opening in said cylinder chamber;
a cylinder rotor eccentrically supported in said cylinder chamber; and
a slider slidably extending through the center of rotation of said rotor having opposite ends maintained in sliding contact with a peripheral edge of said cylinder chamber;
wherein the improvement resides in that:
the peripheral edge of said cylinder chamber is shaped such that it includes a first segment of a predetermined angle interposed between said fluid inlet port and said fluid outlet port, said first segment being circularly arcuate in shape with a radius R where R is the radius of the rotor, a second segment disposed symmetrically with said first segment with respect to the center of rotation of the rotor, said second segment being circularly arcuate in shape with a radius $R'=L-R$ where L is the length of the slider, and a third segment connecting said first segment and said second segment together, said third segment having a shape represented by the formula:

$$R_2(\theta)=\frac{L}{2}+\frac{R'-R}{\theta_o}\left(\theta+\frac{\theta_o}{2\pi}\sin\frac{2\pi\theta}{\theta_o}\right)$$

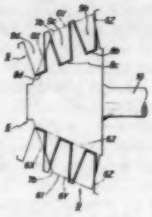
where θ_o in the angle of a segment having the third segment as an arc.

4,373,881

WORM-TYPE ROTARY FLUID COMPRESSOR

Yoshio Matsushita, Kawasaki, Japan, assignor to Iwata Air Compressor Manufacturing Company Ltd., Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 166,073
Claims priority, application Japan, Jul. 9, 1979, 54-85858
Int. Cl.³ F04C *18/12, 23/00*
U.S. Cl. 418—195 **4 Claims**



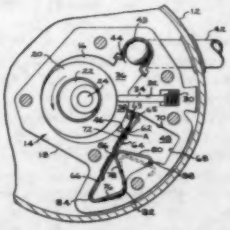
1. A rotary fluid compressor of the type having a worm sealingly interengaging pinion teeth of at least one pinion, comprising:
said worm including a plurality of spiral teeth, said spiral teeth having an outer profile;
adjacent pairs of said spiral teeth defining a groove therebetween, said groove having a bottom groove line;
a cross section of said bottom groove line having a uniform taper from a fluid suction end to a fluid discharge end of said worm;
a cross section of said spiral teeth including a first tapered portion beginning at said suction end and a second tapered portion contiguous to said first tapered portion and ending at said discharge end;
said first tapered portion having an outer profile substantially parallel to said uniform taper whereby a portion of said spiral teeth bounded by said bottom groove line and said first tapered portion have a uniform height;
said second tapered portion being more sharply tapered than said uniform taper whereby a height of said teeth decreases toward said discharge end; and
a casing generally conforming to said first and second tapered portions for sealing said fluid in at least a portion of said grooves.

4,373,882

DISCHARGE VALVE ASSEMBLY FOR COMPRESSOR

William T. Ladusaw, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 30, 1981, Ser. No. 229,909
Int. Cl.³ F01C *21/00*; F16K *15/16*
U.S. Cl. 418—270 **8 Claims**



1. In a rotary compressor, a central compressor body element including a cylindrical wall member and upper and lower end plate members defining an annular compression chamber

for receiving a charge of refrigerant, a high pressure discharge port from said compression chamber, a discharge valve and retainer means assembly comprising:

wall means defining a valve discharge chamber in said central body element extending between said upper and lower end plates, a valve seat on one wall of said valve discharge chamber communicating with said discharge outlet;

a valve retainer in said valve discharge chamber including a base element dimensioned to cooperate with said one wall of said discharge chamber, a spacing element on one end of said base element dimensioned to space said base element from said valve seat, holding means extending from said base element including a first point contacting another wall of said discharge chamber and a second point contacting said base element at a fulcrum intermediate the ends of said base element to secure said retainer in said chamber with said base portion deflected between said fulcrum and said spacing element to form a constant radius therebetween,

a resilient valve member mounted on the base element of said retainer between the base element and said valve seat being biased against said valve seat to overlay said valve seat with said valve being movable between its closed position over said valve seat to an open position forming a constant radius against said base element of said valve retainer.

4,373,883

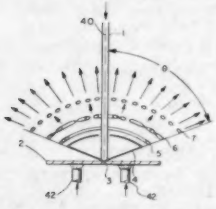
APPARATUS FOR PRODUCING GRANULES FROM MOLTEN METALLURGICAL SLAGS

Kazuo Tachimoto, Tokyo, and Toyosuke Tanoue, Toyonaka, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Division of Ser. No. 2,099, Jan. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 828,856, Aug. 29, 1977, abandoned. This application Feb. 18, 1981, Ser. No. 236,202

Int. Cl.³ B29B *1/54*

U.S. Cl. 425—8 **4 Claims**



1. An apparatus for producing granules from molten metallurgical slag, comprising:

a. a container for the molten slag, and having an outlet for a stream of the slag,

b. a cooled non-wetting target surface having a high degree of smoothness adjacent to and spaced from the outlet for receiving by impingement, a stream of the molten slag from the outlet of the container,

c. means to direct the stream of molten slag from the outlet to impinge upon the target surface at a velocity to cause the stream to rebound therefrom and form an expanding film in the form of an inverted cone with the apex at the point of impingement on the target surface, wherein the cone is formed from degenerating expanding flying rings of the slag from which droplets are subsequently formed and projected along the cone form,

d. means to provide cooling air through which the projected droplets pass to cool and solidify to form the granules, and

e. means to collect the solid granules.

4,373,884

EQUIPMENT FOR THE INJECTION MOLDING OF SPECTACLES BARS OF PLASTIC MATERIAL WITH METAL CORE

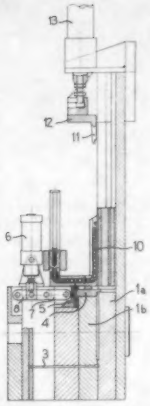
Giovanni Gandini, Via Fabio Filzi, 5, 21040 Venegono Inferiore (VA), and Enrico Talamona, Via Plinio, 18, 21040 Venegono Superiore (VA), both of Italy

Filed Nov. 10, 1981, Ser. No. 320,293

Claims priority, application Italy, Nov. 11, 1980, 25873 A/80

Int. Cl.³ B29F *1/00*; B29C *6/00*

U.S. Cl. 425—126 R **6 Claims**



1. Equipment for the injection molding of spectacles bars of plastic material incorporating a stiffening metal stem or core, of the type comprising a mold closed at one end by a knife element, beyond which and along the extension of the longitudinal axis of the mold a guide is provided for said metal stem to be inserted into the molded bar, and means for pushing the stem out of the guide and into the mold, characterized in that said guide consists of a groove wherein the stem is guided with no slack on part of its sides, at least another side of the stem—from which projects a hinge previously welded at the end of the stem opposite to that of introduction—being guided by means apt to be removed as the stem advances introducing itself in the mold.

4,373,885

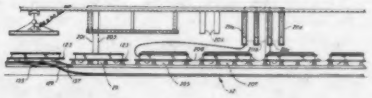
VACUUM SYSTEM FOR A MOVING PRODUCTION LINE

Brice W. Smyth, Newtownabbey, Northern Ireland, assignor to Delorean Research Limited Partnership, Bloomfield Hills, Mich.

Filed Dec. 31, 1980, Ser. No. 221,794

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—129 R **9 Claims**



1. In an assembly line for vacuum assisted molding on which a plurality of molds are transported, means to supply vacuum to said molds comprising:

a. a vacuum generating means associated with each mold;

b. a compressed air manifold having first and second inlets and an outlet associated with each mold, said compressed

air manifold also coupled to provide a compressed air input to said vacuum generating means;

c. a plurality of outlets from said vacuum generating means in communication with vacuum evacuation points formed in the mold;

d. a hose coupled to the outlet of each manifold, said hose adapted for connection to the first inlet of the manifold of a preceding mold on the assembly line; and

e. means for supplying compressed air including a source of compressed air and at least first and second hoses connected to the source of compressed air and adapted for connection to the second inlets of said manifolds.

4,373,886

APPARATUS FOR INJECTING CONFLUENT STREAMS OF PLASTIC MATERIAL INTO AN INJECTION MOLDING DIE

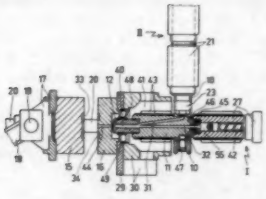
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Continuation of Ser. No. 124,858, Feb. 26, 1980, abandoned, which is a division of Ser. No. 842,105, Oct. 14, 1977, Pat. No. 4,190,409. This application Jun. 17, 1981, Ser. No. 274,419

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646354

Int. Cl.³ B29F *1/00, 1/12*

U.S. Cl. 425—130 **6 Claims**



1. An apparatus for injecting confluent streams of plastic raw material from separate sources into the molding die of an injection molding machine, which machine has a die closing unit carrying a stationary die half on a stationary die carrier plate and a movable die half on a movable die carrier plate, guiding the latter for axial die opening and closing movements on at least two parallel tie rods, the plastic materials injecting apparatus comprising in combination:

an injector head in the form of an intermediate stationary die plate which is mounted on the stationary die carrier plate and supports a stationary cavity plate, as part of the stationary die half;

a generally axially oriented sprue opening in the stationary cavity plate;

a generally axially oriented first injection unit with a plastification screw surrounded by a plastification cylinder having a cylinder nozzle at its discharge end and hydraulic drive means operable to rotate and axially advance the plastification screw for plastification and injection of a first raw material through said cylinder nozzle;

an axial pulsation channel in the injector head linking the opening of the cylinder nozzle of the first injection unit with the sprue opening of the stationary cavity plate;

a generally radially oriented second injection unit with a plastification screw surrounded by a plastification cylinder having a cylinder nozzle at its discharge end and hydraulic drive means operable to rotate and axially advance the plastification screw for plastification and injection of a second raw material through said cylinder nozzle;

a radial pulsation channel linking the opening of the cylinder nozzle of the second injection unit with the sprue opening of the stationary cavity plate;

a centrally located injector nozzle as part of the injector head, the injector nozzle having a cavity which forms a flow junction at an acute angle between the axial and radial pulsation channels and a common nozzle discharge channel at its discharge end, the latter leading directly into the sprue opening of the stationary cavity plate;

a pair of supporting rods guiding the first injection unit for axial movements in relation to the injection head; and

a pair of supporting rods similarly guiding the second injection unit for radial movements in relation to the injection head, both pairs of supporting rods being rigidly connected to the stationary structure of the die closing unit.

4,373,887

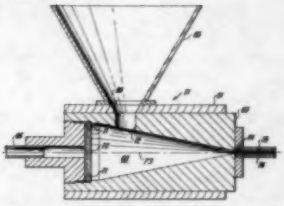
APPARATUS FOR PRODUCING POROUS SHAPED PRODUCTS

Timothy A. Hanson, and David W. Smith, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Continuation of Ser. No. 120,564, Feb. 11, 1980, abandoned, which is a division of Ser. No. 55,637, Jul. 9, 1979. This application Mar. 2, 1981, Ser. No. 239,556

Int. Cl.³ A23G *1/70*

U.S. Cl. 425—143 **4 Claims**



1. Apparatus for forming a fluidized stream of moldable plastic powder and air for injection into a mold comprising:

means defining a conical chamber having an outlet passage at the apex thereof;

means defining an aperture in the conical side of said chamber adjacent to the base thereof for receiving powder to be entrained in an airstream;

means for introducing air at the base of said conical chamber in a swirling stream for entraining and fluidizing plastic powder particles and conveying said particles in a fluidized airstream through said outlet passage;

a mold cavity having an inlet coupled to receive said fluidized airstream from said outlet passage;

and means for introducing water in a controlled amount into said air for moisturizing said fluidized plastic powder airstream.

4,373,888

APPARATUS FOR MASS-PRODUCING MEDICAL TABLETS

Masaki Yamamoto, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 2, 1980, Ser. No. 165,399

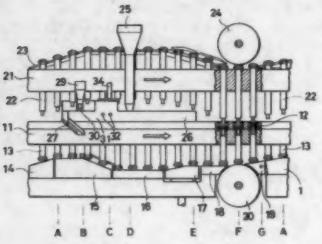
Claims priority, application Japan, Jul. 13, 1979, 54-89407

Int. Cl.³ B26B *17/00*

U.S. Cl. 425—149 **3 Claims**

1. In an apparatus for mass-producing medical tablets, which includes a die cavity support running along a predetermined line, said die cavity support including equally spaced die cavities in the running direction thereof, each of said die cavities being associated with a lower punch ascending and descending therein; an upper punch holder running in parallel with said running direction of said die cavity support, said upper punch holder holding upper punches for ascending and descending in opposite direction to that of said lower punches; medical composition supply means for supplying a medical composition to each said die cavity at a first position where said lower punch

in said die cavity is fully lowered to secure a maximum space to receive said medical composition therein; punch compression means for urging said upper and lower punches toward said die cavity to compact the medical composition into tablets; and tablet discharge means for discharging the tablets from said apparatus after said lower punch ascends in said die cavity, said tablet discharge means being located at a second position where said lower punch is fully raised in said die cavity, the improvement comprising:



(a) a lubricant dispensing compartment located adjacent to said second position and being provided with a lubricant supply means, for dispensing powdered lubricant into each said die cavity on top of each said lower punch after said lower punch has reached said second position; and

(b) a jet compartment located at said first position, and adapted to confine a dispersed lubricant within said jet compartment, and including a jet nozzle for injecting compressed air toward said lower punch, thereby causing the lubricant on top of said lower punch to disperse and fill said jet compartment.

4,373,889

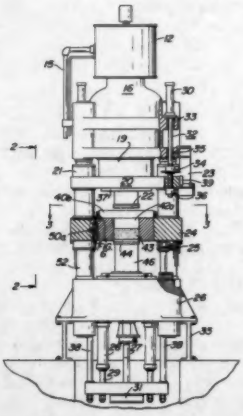
HYDRAULIC PRESS ASSEMBLY

Leonard Brown, Levittown, Pa., assignor to Crossley Machine Company, Inc., Trenton, N.J.

Filed Feb. 13, 1981, Ser. No. 234,172

Int. Cl.³ B29C *3/00*

U.S. Cl. 425—150 **10 Claims**



1. A hydraulic press or the like, comprising:

(a) a hydraulic power unit,

(b) a first plurality of vertically mounted piston cylinders coupled to said power unit and having respective downwardly extending piston rods arranged for movement in a vertical direction,

(c) a ram die assembly adapted to be coupled to said power unit and having a plurality of vertical apertures formed therein, said assembly also including an upper die attached to said ram, said piston rods being arranged to pass with clearance through respective ones of said apertures,

(d) a plurality of upper and lower stop means positioned toward the lower ends of said rods respectively above and below said vertical apertures in said ram assembly and being separated from one another by a predetermined space greater than the depths of said apertures, said ram assembly being movable downwardly at a relatively fast rate while being suspended principally by said lower stop means during most of its downward descent during a cycle of operation,

(e) a mold case below said ram assembly for holding a demountable mold box having a generally centrally-located aperture in the path of said upper die,

(f) a lower die disposed below said mold case and aligned with the aperture thereof, the upper surface of said die being positioned to move into said mold box aperture and cooperate therewith to define a mold cavity in which material to be processed is placed,

(g) means associated with at least one of said stop means and with said ram assembly which cooperate to produce a signal when said upper die has its downward movement arrested by its contact with said material in said mold cavity and is supported substantially only thereby whereupon said piston rods continue their downward movement, and (h) means coupled to said signal producing means and to said power unit for causing, in response to said signal, said power unit to be coupled to said ram assembly to drive it further downwardly at a relatively slow rate but with an extremely high forming force.

4,373,890

MECHANICAL SAFETY COVER INTERLOCK FOR INJECTION MOLDING MACHINE

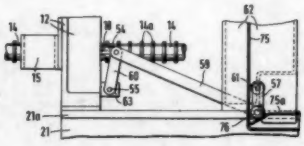
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 320,890

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042712

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—153 **8 Claims**



1. In a die closing unit for an injection molding machine which comprises a stationary die half mounted on a stationary die carrier member, a movable die half mounted on a movable die carrier member, a plurality of parallel tie rods guiding the movable die carrier member and defining the longitudinal axis of the die closing unit, a second stationary member located axially outside the area of the injection molding die, behind the movable die carrier member, and an axially openable and closable safety cover preventing access to at least a portion of the area of the injection molding die in its closed position; in said die closing unit, a mechanical safety cover interlock mechanism comprising in combination:

an arresting rod attached to the movable die carrier member and extending axially rearwardly towards the second stationary member, in parallel alignment with the tie rods,

said stationary member having an opening for the axial movement of the arresting rod therethrough;

an arresting unit mounted on the second stationary member in alignment with the arresting rod and surrounding the latter; and

a control linkage operatively connecting the safety cover to the arresting unit in such a way that a displacement of the safety cover from its closed position actuates the arresting unit in the arresting sense and the complete closing of the safety cover actuates the arresting unit in the releasing sense; and wherein

the arresting rod has, on at least that length portion which moves through the arresting unit, a regularly spaced succession of grooves and intermediate arresting collars which occupy at least two diametrally opposite sides of the arresting rod, the arresting collars having at least one of their two axially opposite flanks oriented transversely to the arresting rod axis, so as to serve as an abutment flank;

the arresting unit includes two arresting jaws arranged on diametrally opposite sides of the arresting rod so as to face the arresting collars of the latter, the arresting jaws being guided for movement into and out of engagement with the arresting rod, each arresting jaw having at least one arresting ridge with at least one of its two axially opposite flanks oriented to cooperate with the abutment flank of an arresting rod collar to produce an arresting action on the arresting rod and connected movable die carrier member;

the arresting ridges of the two arresting jaws and the arresting collars on opposite sides of the arresting rod are axially staggered in such a way that, when the arresting rod is positioned to create a butting alignment between an arresting rod collar and an arresting jaw ridge on one side, the ridge of the other arresting jaw is positioned axially halfway between two successive rod collars on the other side;

the axial spacing of the arresting collars on the arresting rod is not less than twice the combined axial widths of an arresting collar and an arresting ridge, so that a simultaneous butting impingement between arresting collars and arresting ridges on both sides of the arresting rod during the engagement approach of the arresting jaws is made impossible for all arresting rod positions;

the control linkage includes means for actuating the arresting unit by forcibly closing the arresting jaws against each other to obtain a radial engagement between abutment flanks of the arresting rod collars and the arresting jaw ridges, the jaw closing force being derived from the safety cover displacement;

said arresting jaw closing means engages the arresting jaws in such a way that the jaw closing force acts on the two arresting jaws without a force reaction from a stationary part of the arresting unit, so that the position of the arresting jaws during their closing movement, while being determinate relative to each other, is indeterminate relative to the arresting rod within the guided mobility of the arresting jaws, and the closed distance of the arresting jaws is such that the arresting ridge of one jaw remains out of engagement with the arresting rod, when the arresting ridge of the other jaw is fully engaged in an arresting rod groove.

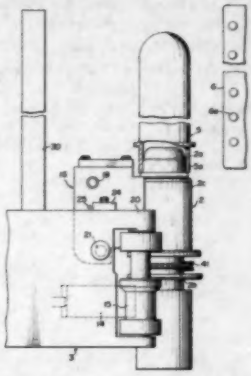
4,373,891

APPARATUS FOR COOLING A TRANSFER MANDREL

Nobuhiro Kishida, Tokyo; Kunihiro Shishido, and Satoshi Haryu, both of Shobu, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 278,005
Claims priority, application Japan, Jul. 27, 1980, 55-86436
Int. Cl.³ B29C *17/07*; F27D *3/12*
U.S. Cl. 425—174.4 **11 Claims**

1. An apparatus for cooling a transfer mandrel, said transfer mandrel including a top portion upon which a thermoplastic resin parison can be mounted, a cylindrical portion disposed beneath said top portion, and a lower portion adapted to be removeably, rotatably engaged with a peripheral portion of a rotary table, said rotary table being adapted to rotate oppositely to a heating means and including means for engaging said lower portion of said transfer mandrel, said cooling apparatus being mounted along the peripheral edge of rotary table above said means for engaging and comprising a cooling block having a cavity through which cooling water flows and a concave surface opposing said cylindrical portion of said transfer mandrel, said concave surface having a profile conforming to the



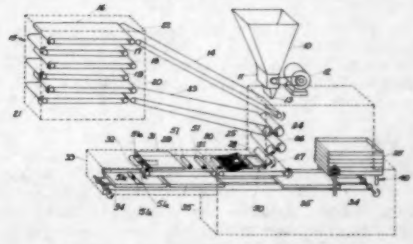
cylindrical portion of said transfer mandrel, means for adjusting the position of the cooling block so that said concave surface of said cooling block may be brought into whole contact with the cylindrical portion of said transfer mandrel when said transfer mandrel is engaged, and a spring which pushes a surface portion of said cooling block opposite said concave surface, whereby the cylindrical portion of said transfer mandrel is cooled so as to prevent said top portion from rising in temperature.

4,373,892

APPARATUS FOR PREPARING BREAD DOUGH

Joseph Nordmann, 3659 Paramount Ridge La., Cincinnati, Ohio 45239

Filed Jan. 11, 1982, Ser. No. 338,209
Int. Cl.³ A21C *3/04, 3/10, 3/02, 11/10*
U.S. Cl. 425—207 **10 Claims**



1. Apparatus for preparing bread dough, comprising a downwardly and inwardly tapering hopper for bulk dough, a rotary pump beneath said hopper communicating therewith, a die through which dough is extruded by said pump in a continuous ribbon, first conveyor means for receiving said ribbon of dough from said die, proofing means through which said ribbon of dough is conducted for a predetermined period of time, second conveyor means for receiving said ribbon of dough from said proofing means, guide rolls for conducting said

ribbon of dough through a substantially vertical path of travel, substantially horizontal conveyor means for receiving said ribbon of dough from said guide rolls, means for cutting said ribbon of dough into individual pieces of predetermined length while traveling on said horizontal conveyor means, means to roll said individual pieces into cylindrical shapes with the axes thereof transverse to the direction of travel of said horizontal conveyor means, means to divide said individual pieces into at least two further pieces of substantially equal size, and means to convey and position a pan beneath the end of said horizontal conveyor means to receive said futher pieces of dough.

4,373,893

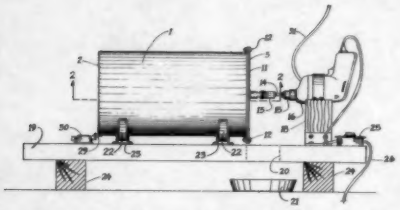
BENCH SCALE DRUM AGGLOMERATOR AND POWER MEANS

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Division of Ser. No. 223,122, Jan. 7, 1981. This application Oct. 29, 1981, Ser. No. 316,344

Int. Cl.³ B22F *3/00*

U.S. Cl. 425—222 **2 Claims**



1. Bench scale apparatus for agglomerating discrete solid particles by joining the same with a salt crystallized from a solution, comprising:

a rotatably mounted horizontal cylinder with a ratio of diameter length of 0.3 to 0.8;

variable drive means for said cylinder including a single phase electric motor;

transfer means for said driving force including a sequentially connected universal joint;

means for control of the speed of cylinder rotation including a variable electric resistance in the motor circuit;

said control means varying the speed of rotation in the range of 25 to 75 percent of the critical speed, where such critical speed is determined by the formula $R=76.5/\sqrt{d}$ where d is the diameter of the cylinder in feet and R is the critical speed in rpm to produce agglomerates by tumbling in said cylinder;

removable end plates in said cylinder having concentric openings 60 to 70 percent of the cylinder diameter;

air cooling means directed on said motor;

a mounting base plate for said assembly sized to fit into a laboratory hood.

4,373,894

METHOD AND APPARATUS FOR MAKING PLASTIC TUBES

George W. Peppel, Arlington, Tex., assignor to Patient Technology, Inc., Hauppauge, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,633

Int. Cl.³ B29C *3/00*

U.S. Cl. 425—393 **8 Claims**

1. Apparatus for manufacturing a thermoplastic tube of substantially uniform thickness and having an end closed pinhole free and with substantially the thickness of the remainder of the tube comprising:

a heated die having one end portion shaped to form a hollow cylinder with a shaped closed end;

means for heating said die;

a heat conductive metallic collar surrounding the hollow cylinder end portion of said die and acting as a heat sink to dissipate heat therefrom;

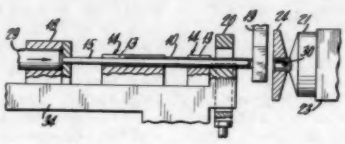
means for supporting an open ended thermoplastic tube of substantially uniform thickness in spaced relationship from said heated die;

a mandrel having an end portion shaped to form a hollow cylinder with a closed end complementary to the shape of said heated die and insertable into said tube through one end thereof;

means for advancing said mandrel into said tube a predetermined distance so that an end portion of the tube projects beyond the shaped end of the mandrel;

means for holding said tube on said mandrel;

first means for relatively moving said tube and mandrel with respect to said heated die so that the tube extends into the



heated die and has its projecting end shaped and closed pinhole free by interaction between the heated die and the shaped end of said mandrel, said heated die and shaped end of said mandrel pressing against the outside and inside respectively of said tube to form the same closed pinhole free in a single forming step to the thickness of substantially that of the thickness of the remainder of said tube and the inner and outer shapes of said heated die and mandrel, said metallic collar dissipating heat from said cylinder to prevent excessive heating of the side walls of the tube during shaping and closing of the projecting end; and

second means for relatively moving said tube and mandrel with respect to said heated die to thereby withdraw the tube from said die.

4,373,895

EXTRUSION DIE AND METHOD FOR PRODUCING EXTRUSION DIE FOR FORMING A HONEYCOMB STRUCTURE

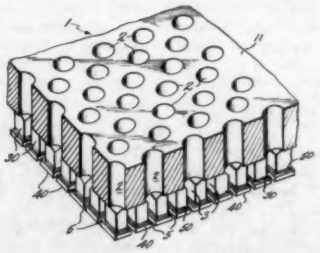
Shinichi Yamamoto, Takahama, and Toshihiko Ito, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 11, 1980, Ser. No. 186,268

Claims priority, application Japan, Sep. 12, 1979, 54-117626

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—461 **49 Claims**



1. A method for producing an extrusion die to be used in forming a honeycomb structure provided with numerous axially extending passages which are separated by thin walls, comprising the steps of:

preparing from a single metallic block a die body having

opposing end surfaces and a shape and size corresponding to those desired for said extrusion die,

forming numerous discrete initial feed passageways in said die body for initially receiving and feeding an extrudable material of said honeycomb structure and interconnected pooling slots for pooling and distributing said extrudable material directly fed from said feed passageways temporally,

said feed passageways being formed from one of said end surfaces of said die body towards the other end surface opposed to said one end surface in an axial direction of said die body at predetermined intervals to a predetermined depth,

said interconnected pooling slots being formed from said other end surface of said die body towards said one end surface thereof to the level of said predetermined depth,

the inner end of each of said feed passageways being directly communicated with said pooling slots,

securing a metallic plate directly to said other end surface of said die body to cover said pooling slots, and

forming interconnected extrusion slots in said metallic plate so as to be respectively narrower than but in register and communicated with said interconnected pooling slots for extruding said extrudable material distributed through said pooling slots,

said interconnected extrusion slots having the same shape and width as a transverse cross section of said walls of said honeycomb structure.

29. An extrusion die for making a honeycomb structure, comprising:

an integral metallic die body having two opposed surfaces from one of which a multiplicity of discrete feed passageways extend inwardly to a level of about 13 mm. to about 16 mm. toward the other of said surfaces and having in said other surface a grid network of criss-crossing pooling slots running transverse to said passageways and forming a multiplicity of intersections and being interconnected throughout said network and extending from said other surface toward said one surface to said level at which said passageways meet said slots for direct communication, said pooling slots being formed by individual columns integral with said die body,

the number of said feed passageways being substantially less than the number of said pooling slot intersections, and

a multiplicity of discrete metallic platelets each larger than said columns in transverse dimensions and nonintegral with said die body but respectively secured permanently to said columns and together forming a grid network of interconnected extrusion slots respectively registering on said pooling slots but having a width substantially narrower than said pooling slots.

4,373,896

BURNER CONSTRUCTION

Eugene B. Zwick, Huntington Beach; Dung D. Nguyen, Fullerton; William D. Brigham, Westminister, and Kenneth Hoffman, Fountain Valley, all of Calif.

Division of Ser. No. 956,375, Oct. 31, 1978. This application Apr. 3, 1981, Ser. No. 250,834

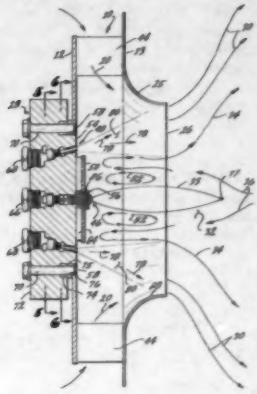
Int. Cl.³ F23Q *9/00*

U.S. Cl. 431—9 **12 Claims**

1. A method for maintaining a uniform pilot flame within a burner having an axis defined by a cylindrically shaped combustion chamber, said pilot flame disposed on said axis, operating independently over a range of combustion air flow rates, said method comprising the steps of:

introducing a combustion air flow into the burner;

providing said combustion air flow with a swirling flow configuration that establishes a quiet-air zone within the burner by injecting combustion air into said burner in a forwardly axial direction generally tangential to and slightly away from said pilot flame and tangential to the walls of said cylindrical combustion chamber thereby creating a secondary air flow in the reverse direction along said axis of said combustion chamber in a direction toward said pilot flame and thereby creating a generally quiet-air region encircling said pilot flame, interaction between said secondary air flow and said combustion air flow pulling air from said quiet-air region at a rate gener-



ally proportional to the rate of air flow into said quiet-air region from said secondary air flow,

whereby said pilot flame consumes fuel at a rate substantially independent from the rate of injection of said combustion air flow.

4,373,897

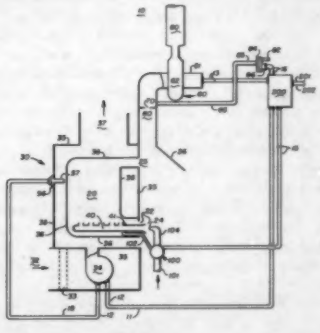
OPEN DRAFT HOOD FURNACE CONTROL USING INDUCED DRAFT BLOWER AND EXHAUST STACK FLOW RATE SENSING

Ralph H. Torborg, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 15, 1980, Ser. No. 187,040

Int. Cl.³ F23N *3/00*

U.S. Cl. 431—20 **11 Claims**



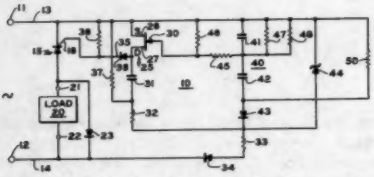
1. In a heating system having a combustion chamber with a fuel burner located adjacent an air opening, an exhaust stack, and an open draft hood connected to said exhaust stack and in communication with an upper end of the combustion chamber and open to atmospheric air, the improvement comprising:

(a) a blower connected to the exhaust stack for inducing a draft in the exhaust stack and for drawing air into the combustion chamber and into the draft hood;

(b) means adapted to be mounted in the exhaust stack for

forming a flow restriction in the exhaust stack upstream from the blower;
(c) fuel supply control means responsive to a control signal representing flow of exhaust gas through the flow restriction to supply fuel to the burner only when such control signal exceeds a predetermined magnitude;
(d) sensor means for sensing a quantity representative of said flow of exhaust gas through the flow restriction and for communicating said quantity as a control signal to said fuel supply control means; and
(e) blower control means adapted for connection to the blower for starting and stopping operation of the blower.

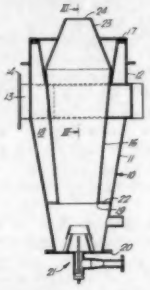
4,373,898
TIMER AND CONTROL CIRCUIT
John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 13, 1981, Ser. No. 243,271
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—73 **8 Claims**



1. A timer and control circuit having a timing sequence with two timing intervals established by creating a plurality of operating modes for a field effect transistor with said circuit adapted to control load means, including: silicon controlled rectifier means having gate means with said silicon controlled rectifier adapted to connect said load means to a source of alternating current voltage; a field effect transistor having a source-drain channel means and a control gate with said source-drain channel means connected to said silicon controlled rectifier gate means to control the conduction of current through said silicon controlled rectifier means and said load means; said source-drain channel means further connected in a series circuit with a capacitor, a diode, and impedance means with said series circuit connected across said source of voltage; resistance means connected in parallel circuit with a series combination of said source-drain channel means and said capacitor; capacitor voltage divider means connected to said source of voltage and initially charged upon application of said source of voltage to said timer and control circuit; said capacitor voltage divider means connected to said field effect transistor control gate to bias said field effect transistor to establish said plurality of operating modes for said field effect transistor; and bleeder impedance means connected to said capacitor voltage divider means to bleed off said initial charge from said capacitor voltage divider means to cause said field effect transistor to sequentially pass through said plurality of operating modes.

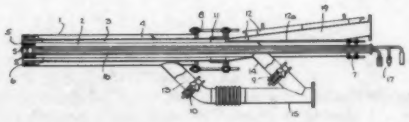
4,373,899
FUEL REACTOR
Gerardus A. Markus, Gravenzande, Netherlands, assignor to Black, Sivalls & Bryson, Houston, Tex.
Filed Apr. 24, 1981, Ser. No. 257,273
Claims priority, application United Kingdom, Jun. 17, 1980, 8019826
Int. Cl.³ F23D *15/00*
U.S. Cl. 431—158 **12 Claims**

1. A fuel reactor comprising, in combination:
(a) a generally circular cross-section elongate outer shell having an inlet axial end and an outlet axial end opposite thereto;
(b) an end wall closing said outer shell at said inlet end;
(c) a fuel inlet in said end wall and adapted to project fuel axially into said outer shell;
(d) an inner shell mounted within said outer shell to define an annular space therebetween;
(e) means connecting the inner and outer shells together at said discharge end of the inner shell;
(f) an open end at the other end of the inner shell axially spaced from said end wall of the outer shell;



(g) a tangential combustion air inlet connected to the annular space at an axial location spaced from said other end of the inner shell;
(h) a discharge nozzle mounted on the discharge end of the inner shell; and
(i) at least one opening in the inner shell adjacent the discharge nozzle communicating with the annular space, to allow some of the air to flow onto the exterior of the discharge nozzle to cool it.

4,373,900
BURNER FOR A KILN
Günther Eckelmann, Niedernhausen, Fed. Rep. of Germany, assignor to Pillard, Inc., Richmond, Va.
Filed Nov. 23, 1979, Ser. No. 96,813
Int. Cl.³ F23M *9/00*
U.S. Cl. 431—182 **12 Claims**



1. A burner for a kiln comprising
a first duct for conveying an air flow, said first duct having an annular outlet at a terminal end directed in a diverging direction to expel the air flow in a radially outward direction;
swirl means at said outlet of said duct for imparting a swirling effect to the expelled air flow;
a second duct concentric to and about said first duct for conveying a flow of pulverized coal, said second duct having an outlet at one end to expel the pulverized coal into a flame;
a third duct concentric to and about said first and second ducts for conveying an air flow, said third duct having an outlet concentric to and about said first duct outlet for expelling an air flow with an axial component; and
means for adjusting the air flows in said first and third ducts

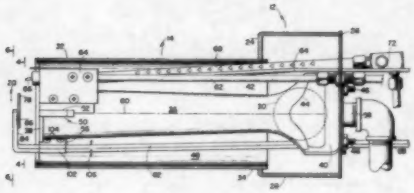
to adjust the shape of the flame extending from said second duct between an elongated shape and a flared conical shape.

4,373,901

ADJUSTABLE FLAME SPREADER FOR GUN-TYPE POWER GAS BURNER

Robert A. Kaplan; Mark A. Reicke, and James E. Wellman, all of Fort Wayne, Ind., assignors to The Scott & Fetzer Company, Fort Wayne, Ind.

Filed Jan. 16, 1981, Ser. No. 225,846
Int. Cl.³ F23C *5/06*
U.S. Cl. 431—186 **9 Claims**



1. In a gun-type power gas burner comprising a plenum chamber having spaced front and rear walls joined by a side wall; an elongated blast tube having spaced distal and proximal ends and having a longitudinal axis, said proximal end being connected to said front wall and communicating with said plenum chamber; a blower having an air discharge duct connected to one of said walls and communicating with said plenum chamber; an elongated air-gas mixing tube coaxially disposed in said blast tube and having spaced discharge and inlet ends, said discharge end being adjacent said blast tube distal end and said inlet end extending into said plenum chamber, said mixing tube being circumferentially spaced from said blast tube to define a secondary air passage therewith, said mixing tube having an air admitting opening therein adjacent said inlet end and communicating with said plenum chamber; a gas supply line extending through one of said walls and into said inlet end of said mixing tube; and an imperforate flame spreader member spaced outwardly from said discharge end of said mixing tube and normal to said axis: the improvement wherein said flame spreader member is mounted on one end of an elongated element and comprising means for adjustably supporting the other end of said element on one of said plenum chamber walls for selective longitudinal movement of said element and flame spreader member between a first position closely spaced from said discharge end of said mixing tube and a second position spaced outwardly from said first position thereby selectively to adjust the width and length of the flame, said other end of said element extending rearwardly of said rear wall for manual adjustment of said element between said position thereof.

4,373,902

IMMEDIATE IGNITION SMOKELESS BURNING OF WASTE GASES

Robert D. Reed, and Robert E. Schwartz, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 26, 1981, Ser. No. 228,139
Int. Cl.³ F23D *15/00*
U.S. Cl. 431—202 **9 Claims**

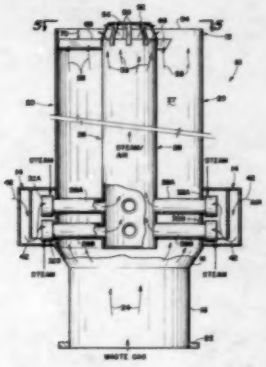
1. An improved combustion apparatus for smokeless combustion of waste gases, comprising;

(a) a vertical flare stack of selected height and diameter having an outer steel wall; a top portion of selected length called a combustion portion;

(b) a coaxial central steam-air pipe of selected diameter supported inside said outer wall, closed off at its bottom end, and extending upwardly almost to the top of said outer wall;

(c) a plurality of circumferentially spaced radial steam-air tubes, of selected diameter inserted through the wall of said steam-air pipe near its bottom end, and said outer steel wall; said steam-air pipe supported concentrically at its top end by a plurality of radial bars of selected circumferential width, positioned between said steam-air pipe out to and through said outer wall;

(d) steam and air manifold means surrounding said outer



wall and enclosing the outer ends of said steam-air tubes; for flow of primary combustion air and steam to said steam-air pipe;

(e) the top of said steam-air pipe covered with a baffle plate of selected diameter, supported above the top of said steam-air pipe a selected distance, by a selected plurality of support legs of selected circumferential width, circumferentially spaced; said manifold adapted to receive a supply of steam at a selected pressure, and air, said stack adapted to receive a flow of waste gas of selected flow rate.

4,373,903

BURNER SYSTEM

Joachim Wünning, Leonberg, Fed. Rep. of Germany, assignor to Aichelin GmbH, Korntal-Münchingen, Fed. Rep. of Germany

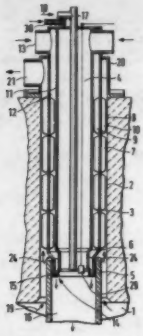
Filed Nov. 24, 1980, Ser. No. 209,591
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948048
Int. Cl.³ F23D *11/44;* **F27B** *5/14;* **B05B** *1/24*
U.S. Cl. 431—215 **12 Claims**

1. A burner system for heating oven spaces of industrial ovens of the kind using a ceramic burner tube at the downstream end of the burner system and an air supply tube coaxial with the burner tube connecting therewith to provide a burner port in the region of the connection, where air and fuel are mixed for ignition, a fuel supply tube of smaller diameter leading to the burner port region being centered within the air supply tube, the air supply tube being surrounded by a passage through which combustion product gases pass out in countercurrent to the air supply and being equipped with means constituting a recuperator for preheating of the air supply by heat removed from the combustion product gases, said air supply tube further having an air-guiding cylinder within it for confining the air supply flow to an annular space for effective operation of said recuperator, said burner system further comprising the improvement which consists in that:

an annular nozzle (15) adjacent to the interior wall of said burner tube (5) is connected to said air supply tube (6) at its extremity, for causing air from said annular space (12) of said air supply tube to flow out at increased velocity in

an annular jet along the interior wall of said burner tube (5), and

means are provided for cooling said air supply tube (6) in the



region of its extremity at said burner port (14) by gas, of a temperature lower than that of the flame gases, penetrating between said air supply tube (6) and said burner tube (5).

4,373,904

INFRA-RED GENERATOR

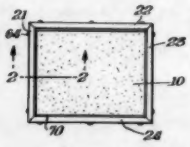
Thomas M. Smith, 114 Villinger Ave., P.O. Box C-94, Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 20,079, Mar. 13, 1979, Pat. No. 4,290,746, Ser. No. 94,901, Nov. 16, 1979, Pat. No. 4,272,238, Ser. No. 952,332, Oct. 18, 1978, Pat. No. 4,326,843, and Ser. No. 775,838, Mar. 9, 1977, Pat. No. 4,272,237, which is a continuation-in-part of Ser. No. 701,687, Jul. 1, 1976, abandoned, Ser. No. 906,229, May 18, 1978, Pat. No. 4,157,155, and Ser. No. 674,409, Apr. 7, 1976, Pat. No. 4,035,132. This application Aug. 14, 1980, Ser. No. 178,121

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—328 9 Claims



1. In a gas-fired radiant heater having a porous refractory mat on one face of which a gaseous combustion mixture is burned, and mounting means holds the mat with its opposite face against an open combustion mixture plenum box from which gaseous combustion mixture is passed through the mat so that it can be burned, the improvement according to which the sole structure for preventing movement of the combustion mixture to the edges of the mat from the mat's interior is a second plenum encircling the combustion mixture plenum box and having a plenum face against which the mounting means holds said opposite face of the mat all around the mat margin, the second plenum having narrow slot means along that plenum face through which slot means a different gas can be discharged into said opposite face of the mat to act as a confining barrier around the combustion mixture in the mat.

4,373,905

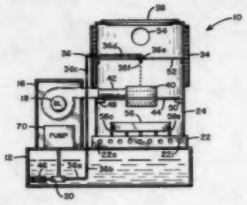
OIL HEATER

Allen J. Hettich, 4800 W. Richmond Rd., Aberdeen, S. Dak. 57401

Filed Aug. 4, 1980, Ser. No. 175,124

Int. Cl.³ F23D *7/00*

U.S. Cl. 431—330 9 Claims



1. Waste oil heater for burning of waste oil comprising:

a. combustion chamber means including chamber access and vent access;

b. fuel introducing means in an upper center portion of said chamber means and connected to a pump source of fuel; and

c. combustion air introducing and mixing means including a closed annular channel suspended in the combustion chamber means below the fuel introducing means with air holes in inner and outer surfaces of the channel, said annular channel connected to an air blower whereby said fuel introducing means drops droplets of fuel into said combustion air introducing and mixing means for combustion of fuel and resultant vapors of mixed air and gases in the area surrounding the combustion air introducing and mixing means thereby providing for maximum heat output.

4,373,906

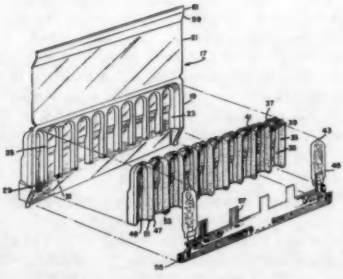
MULTI-LAMP PHOTOFLASH UNIT AND FABRICATING PROCESS

James L. Holmes, Montoursville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 29, 1980, Ser. No. 221,074

Int. Cl.³ F21K *5/02*

U.S. Cl. 431—359 21 Claims



1. A multi-lamp photoflash unit comprising:

a housing member having back and front portions with said back portion having a plurality of spaced cavities each having a longitudinal axis and a planar surface intermediate each pair of said spaced cavities normal to said longitudinal axis, said front portion transmitting light and formed to enclose said cavities and one side of said planar surface;

a reflector unit having a plurality of spaced cavities with a

back surface thereof nesting within said cavities of said housing member and a front surface having a light reflective surface and formed to receive a flashlamp, said reflector unit having a planar surface intermediate each pair of said cavities and aligned with a planar surface of said housing member; and

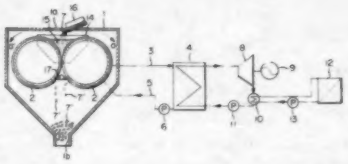
a venting aperture extending through at least one aligned planar surface of said reflector unit and housing member.

4,373,907

APPARATUS FOR MANUFACTURING RAPIDLY COOLED SOLIDIFIED SLAG

Shuji Kajikawa; Kazuo Kanai, and Haruo Ito, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 268,074
Claims priority, application Japan, Jun. 13, 1980, 55-79977
Int. Cl.³ F27D *15/02, 3/00;* **C21B** *3/06*
U.S. Cl. 432—83 **6 Claims**



1. In an apparatus for manufacturing a rapidly cooled solidified slag, which comprises:

a pair of cooling drums housed in a housing, each having a peripheral surface, each cooling drum having the same diameter and the same length, the peripheral surfaces of said cooling drums being in contact with each other, the axial lines of said pair of cooling drums being arranged in parallel with each other in the same horizontal plane;

a driving means for rotating said pair of cooling drums in directions opposite to each other at the same peripheral speed in the rising direction of the peripheral surface of each of said pair of cooling drums at the contact portion of said pair of cooling drums;

means defining a pair of weirs arranged at the both ends of said pair of cooling drums, to form a slag sump in cooperation with the upper half of the peripheral surface of each of said pair of cooling drums;

a slag feeding means arranged above said pair of cooling drums, for pouring a molten slag into said slag sump;

a scraper provided so as to be in contact with the lower half of the peripheral surface of each of said pair of cooling drums;

cooling water for cooling said pair of cooling drums, said cooling water being supplied into each of said pair of cooling drums from an end of a hollow center axle located within each of said pair of cooling drums, said cooling water exchanging heat with said molten slag in said slag sump, which slag has adhered to the peripheral surface of each of said pair of cooling drums, along with the rotation of each of said pair of cooling drums, and, said cooling water which has exchanged heat with said molten slag being discharged to the outside of each of said pair of cooling drums from the other end of said center axle of each of said pair of cooling drums for heat recovery;

whereby said molten slag adhered to the peripheral surfaces of said pair of cooling drums is converted into a rapidly cooled solidified slag through heat exchange with said cooling water and is then peeled off from the peripheral surfaces of said pair of cooling drums by means of said scraper, along with the rotation of said pair of cooling drums;

the improvement wherein:

each of said pair of weirs defined by said weir defining means has an annular shape and has a hollow portion therein; and

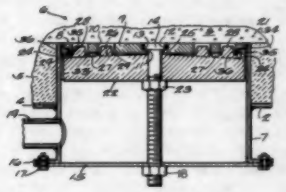
said means defining each of said pair of weirs being respectively fixed to each edge of the peripheral surface of one of said pair of cooling drums so as to form a circular flange at right angles to the axial line of said one cooling drum over the entire circumference thereof.

4,373,908

KILN SHELL NOZZLE WITH ANNULAR FLUID DELIVERY

Peter J. Petit, Milwaukee, and Walter J. Hartwig, Watertown, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 23, 1981, Ser. No. 323,896
Int. Cl.³ F27B *7/36, 7/06;* **F02M** *45/00;* **C21B** *11/06*
U.S. Cl. 432—109 **2 Claims**



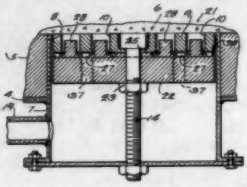
1. A self-cleaning port assembly for delivering fluid through a shell of a horizontal rotating reactor, such as a generally horizontal rotary kiln, for treating a tumbling bed of mixed-size particulate material; said port assembly having a hollow sleeve adapted for attachment to the reactor shell and with a first end thereof in communication with a chamber within the reactor; a cylindrical nozzle coaxially within said sleeve adjacent said first end of the sleeve; an orifice formed in the nozzle; means for delivering a fluid to said sleeve remote from said first end of said sleeve and said nozzle; a base member in said sleeve between said nozzle and said fluid delivery means with said base member cooperating with the nozzle to define a fluid distribution cavity therebetween; a platform extending from said base member through the fluid distribution cavity and into the nozzle orifice in spaced relation to said nozzle; an annular shoulder abutting said platform and said base member with said annular shoulder projecting away from the platform and away from the base member into the fluid distribution cavity; said annular shoulder, platform and nozzle cooperating to define an orifice fluid passage for permitting passage of fluid from the fluid distribution cavity into the reactor chamber, the improvement comprising:

at least a portion of said base member is spaced from said sleeve to define therebetween a fluid supply passage connecting said fluid delivery means to said fluid distribution cavity; a plurality of rest tabs circumferentially spaced upon a side of the base member adjacent the nozzle; the outer circumferential surface of said nozzle adjacent said base member defines a radial and axially extending notch; a sealing ring within said notch secured between the notch defining surfaces of said nozzle and said base member rest tabs with said sealing ring engaging said sleeve in sealing contact; whereby fluid under pressure passes from said fluid delivery means through the fluid supply passage and is diverted by said sealing ring to pass between said rest tabs into the fluid distribution cavity and into said orifice fluid passage for discharge from the port assembly.

4,373,909
GAS INJECTING KILN SHELL NOZZLE WITH PARTICLE ENTRY BARRIERS

Peter J. Petit, and Thomas J. Gill, both of Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 23, 1981, Ser. No. 323,897
Int. Cl.³ F27B *7/36, 7/06;* **C02M** *45/00;* **C21B** *11/06*
U.S. Cl. 432—109 **4 Claims**



1. A port assembly for supplying fluid through a shell of a reactor, such as a generally horizontal rotary kiln, for treating therein a tumbling bed of mix sized particulate material; said port assembly having a hollow sleeve adapted for attachment to the reactor shell and having a first end thereof in communication with a chamber within the reactor, the improvements comprising:

(a) a cylindrical nozzle coaxially disposed within said sleeve adjacent said first end of said sleeve; an orifice formed in said nozzle having a central axis parallel to the sleeve;

(b) means (19) for delivering a fluid to said sleeve remote from said first end of said sleeve and said nozzle;

(c) a base member in said sleeve between said nozzle and said fluid delivery means with said base member cooperating with said nozzle to define a fluid distribution cavity therebetween and said base member cooperating with said sleeve to define a fluid passage from said fluid delivery means to said fluid distribution cavity;

(d) a platform axially extending from said base member through the fluid distribution cavity and into the nozzle orifice in spaced relation to said nozzle; said platform cooperating with the nozzle to define an annular chamber in communication with the fluid distribution cavity and open on the side of said nozzle opposite said fluid distribution; and

(e) an annular shoulder abutting said platform and said base member with said annular shoulder projecting away from the platform and away from the base member into the fluid distribution cavity in spaced relation to said nozzle and nozzle orifice to thereby cooperate with the nozzle to define a particle barrier gap between the nozzle and the shoulder on a side of the nozzle facing the base member; whereby ingress of particulate material from the reactor chamber into the port assembly is screened by a multistage screening in which particles too large to pass into the annular chamber are excluded therefrom and particles small enough to pass into the annular chamber are screened from entering the fluid distribution cavity by the particle barrier gap.

4,373,910
NON-TANGLING CHAIN LINK

Jorgen O. Bernt, 1357 Amber Crescent, Oakville, Ontario, Canada

Filed Sep. 1, 1981, Ser. No. 298,315
Int. Cl.³ F27B *7/14;* **F16G** *13/06*
U.S. Cl. 432—118 **4 Claims**

1. Chain for use in rotary kiln-type devices containing gas-borne particulate material, said chain comprising:

a plurality of flat area links having, in their designed orientation on said chain, flat material of greater width and depth dimensions than thickness dimensions,

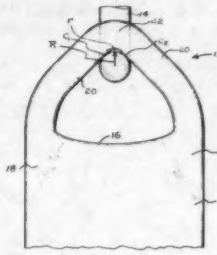
a loop at each end of said flat material, defined by extensions extending from a location adjacent one side edge of said flat material and from a location adjacent the other side edge of said flat material,

said extensions converging to a junction remote from said flat material, said extensions conforming generally to the median plane of the flat material,

connector links alternating along said chain with said flat area links and joining a loop of one flat area link to a loop of the next,

said connector links defining a median plane,

said extensions defining an opening viewed perpendicular to the median plane of the flat material which at said junction



has a smaller inside radius of curvature than the radius of curvature of the cross section of the connector link at its extension contacting extents,

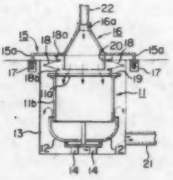
said connector links defining an opening viewed perpendicular to the median plane of the connector link which has a larger inside radius of curvature than the radius of curvature of the cross section of the extensions at their connector link contacting extents,

whereby with said chain hanging vertically and the connector link median planes are respectively perpendicular to said flat material median planes, a connector link contacts a loop at two and only two contact points.

4,373,911
APPARATUS FOR PREHEATING A STEEL SCRAP

Takasaburo Date, Yokohama; Toshimichi Maki, Tokyo; Mitsuya Iguchi, Himeji; Sumifusa Iwamaru, Himeji, and Hisashi Watanabe, Himeji, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Toshin Seiko Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,678
Claims priority, application Japan, Aug. 29, 1980, 55-122941[U]
Int. Cl.³ F27B *9/04, 3/18;* **F27D** *17/00;* **C21B** *7/22*
U.S. Cl. 432—152 **5 Claims**



1. In an apparatus for preheating steel scrap, which comprises:

means defining a preheating vessel for receiving and preheating steel scrap, said preheating vessel having an open top and a bottom lid for said preheating vessel, said bottom lid being capable of being opened and closed, said preheating vessel being adapted to receive steel scrap to be preheated through said open top and to discharge the

steel scrap preheated in said preheating vessel by opening said bottom lid;

means defining a downwardly and outwardly flaring hood for covering said open top of said preheating vessel, said hood being removable from said open top of said preheating vessel to permit introduction of high-temperature waste gases discharged from a steel-refining metallurgical furnace into said preheating vessel;

means defining a housing for containing said preheating vessel with a first gap between said housing and said preheating vessel, said preheating vessel including means for discharging waste gases from the bottom thereof into said housing, said housing comprising a duct for discharging to the outside said waste gases discharged into said housing from the bottom of said preheating vessel after preheating said steel scrap received in said preheating vessel; and

means defining a canopy for sealing said first gap between said housing and said preheating vessel housed in said housing, a gap between the periphery of said canopy and said housing being liquid-sealed;

the improvement wherein:

said canopy is gas-tightly fixed to said hood;

a second gap is provided between said canopy and said preheating vessel housed in said housing; and

a sealing means is coupled between said canopy and the upper portion of said preheating vessel for sealing said second gap between said canopy and said preheating vessel, said sealing means being fixed at an end thereof to said canopy.

4,373,912

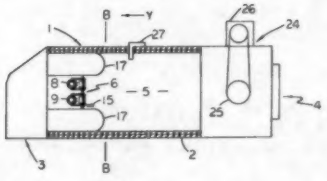
AIRSTREAM HEATER

Edward J. Mitchell, 225 Stapleton Dr., Prarie Grove, Ark. 72753

Filed Feb. 6, 1981, Ser. No. 232,353

Int. Cl.³ F24H *1/00*; F23M *9/00*; F23C *5/06*

U.S. Cl. 432—222 **5 Claims**



1. A heater for heating an airstream comprising:

(a) a heater housing having an upstream end and a downstream end with an air inlet proximate the upstream end and an air outlet proximate the downstream end and a heating chamber situated between said air inlet and air outlet, said heating chamber having an upstream end and downstream end and a longitudinal axis generally parallel to the direction of air flow through said heating chamber;

(b) a burner situated within the heating chamber proximate the longitudinal axis thereof and proximate the upstream end thereof, said burner having at least one fuel conduit at least one fuel port on each such conduit to direct flow of a combustible substance generally toward the downstream end of said heating chamber, a first baffle means for each said fuel conduit, said first baffle means being adjacent said fuel conduit and extending from the fuel conduit in a direction generally toward the downstream end of the heating chamber then bending back toward the upstream end of the heating chamber and away from said fuel port, a second baffle means for each said fuel conduit said second baffle means being adjacent said fuel conduit at the portion of the fuel conduit where the first baffle means adjoins said fuel conduit and extending from the fuel conduit in a direction generally toward the downstream end of the heating chamber then bending back toward the upstream end of the heating chamber and away from said fuel port, and a tubular member corresponding to each said fuel port mounted between the first baffle means and second baffle means so as to have the passageway through said tubular member aligned with the corresponding fuel port to further direct the combustible substance generally toward the downstream end of said heating chamber, said tubular member having an upstream end and downstream end and being adjustably mounted to allow for adjustment in the direction generally parallel to the longitudinal axis of said heating chamber so that the distance between the upstream end of the tubular member and the fuel conduit of its corresponding fuel port can be varied to allow for varying amounts of air being mixed with said combustible substance with said tubular member;

(c) a fuel line connected to said burner to supply said combustible substance to the burner to be ignited when mixed with the airstream and thereby heat the airstream in the heating chamber; and

(d) airstream movement means to force air into the air inlet through the heating chamber and out the air outlet of the heater housing.

4,373,913

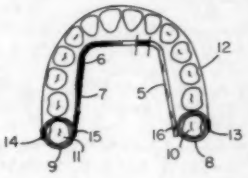
CFC EXPANSION ARCH

James R. McAndrew, 3233 Sherwood Forest Blvd., Suite 202, Baton Rouge, La. 70816

Filed May 15, 1981, Ser. No. 264,036

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—7 **3 Claims**



1. A continuous force control arch expander for use in orthodontics comprising:

A. A set of anchor bands for fixed attachment to molar teeth on opposite sides of the arch,

B. a pair of expansion wires rigidly and tangentially attached one each to said anchor bands having means for placement of a continuous expansion force against the interior surface wall of teeth, and

C. a control wire fixedly attached at its opposite ends to said anchor bands in a position to be fitted about the outside of the tooth line.

4,373,914

ORTHODONTIC DEVICE

Earl J. Colbert, 3696 Montego Dr., Huntington Beach, Calif. 92649

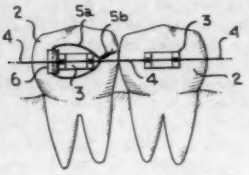
Filed Oct. 30, 1981, Ser. No. 316,764

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—18 **3 Claims**

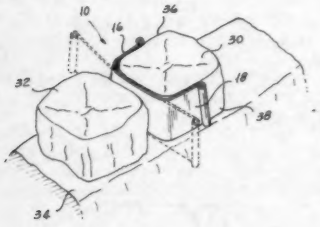
1. An orthodontic device comprising a bracket connected to a tooth, an arch wire associated with said bracket, a rod shaped

rotator with a ligature wire for attaching said rotator and connecting the rotator adjacent said bracket and between said



arch wire for holding said rotator securely for permitting rotation of the tooth.

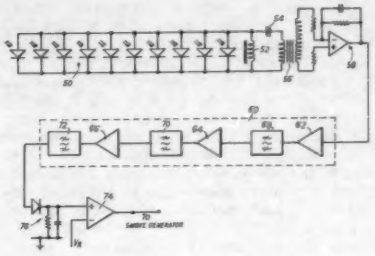
4,373,915
IATROGENIC SHIELD
Herold E. Comstock, Rte. 4, Box 35-A, Winchester, Va. 22601
Filed Nov. 2, 1981, Ser. No. 316,994
Int. Cl.³ A61C *5/14*
U.S. Cl. 433—136 **6 Claims**



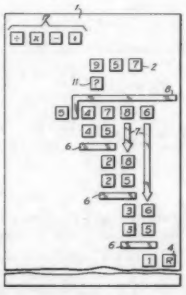
1. A shield comprising a resilient band having a front portion adapted to be placed against the interproximal surface of a tooth and two side portions, said band being biased so that said side portions hug the buccal and lingual surfaces of said tooth, and loops at the ends of said sides for receiving elements of a tool adapted to spread said sides to facilitate placement and removal of said shield.

4,373,916
WEAPON EFFECT SIMULATORS
David W. Ashford, and Robert Hummel-Newell, both of Farnborough, England, assignors to The Solartron Electronic Group Limited, Farnborough, England
PCT No. PCT/GB80/00092, § 371 Date Jan. 8, 1981, § 102(e) Date Jan. 8, 1981, PCT Pub. No. WO80/02741, PCT Pub. Date Dec. 11, 1980
PCT Filed May 22, 1980, Ser. No. 229,602
Claims priority, application United Kingdom, May 25, 1979, 7918367
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—22 **6 Claims**

1. A weapon effect simulator having a projector arranged to project a beam of electromagnetic radiation during simulated firing of a weapon and a detector arranged to detect incidence of said radiation thereupon, characterised in that:
aid projector is arranged to generate at least one burst of radiation for each said firing, said burst being of predetermined duration and being modulated at a predetermined frequency; and in that said detector includes frequency-selective means tuned to a frequency harmonically related to said predetermined frequency and having a pass band dependent upon said predetermined duration.



4,373,917
EDUCATIONAL DEVICE FOR TEACHING ARITHMETICAL OPERATIONS
Priscilla H. Jackson, 824 Dorian Rd., Westfield, N.J. 07090
Filed May 28, 1981, Ser. No. 267,752
Int. Cl.³ G09B *1/06, 19/02*
U.S. Cl. 434—209 **10 Claims**



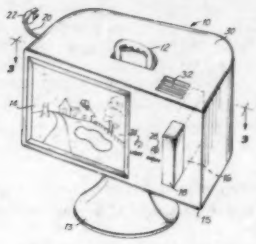
1. An educational device for teaching large division and multiplication operations which comprises in combination:
(a) a graph-like base member having a set of 4 symbols positioned in the upper region thereof, said symbols consisting of a division symbol, a multiplication symbol, a subtraction symbol and a downwardly pointing arrow;
(b) a plurality of movable numbers to be applied onto said graph-like base member and having depicted on at least one main surface thereof numerals from 0 through 9, pre-established letters of the alphabet, punctuation symbols or mathematical process signs;
(c) a plurality of bars of predetermined length and having a width equal to at least about one-third the width of said movable members, at least one of said bars being longer than the others and having an L-shaped configuration;
(d) a plurality of arrow-like members of varied length and of width substantially equal to the width of said bars.

4,373,918

AUDIO-VISUAL, CHILD-PARTICIPATING EDUCATIONAL ENTERTAINMENT CENTER

Mort Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,651
Int. Cl.³ G09B *5/06*; A63H *33/14*; G03B *21/10*
U.S. Cl. 434—307 **9 Claims**



1. An audio-visual, child-participating, educational entertainment center, comprising:

(a) a screen;

(b) kit means including a plurality of applique means each being strippably adherable to the screen when applied thereto;

(c) video means for displaying a series of sequential visual displays on the screen to constitute an animated feature which is viewable by a child;

(d) audio means for generating sound accompaniment for the animated feature, said sound accompaniment including narrated instructions directing the child to apply the applique means to the screen; and

(e) pace-setting means for stopping the sound accompaniment and animated feature at any desired one of the visual displays for a variable time interval, each time interval being different for each child and being dependent on the level of skill of the respective child, said time interval being of time duration sufficient to permit the respective child to apply the applique means to the stopped visual display displayed on the screen at his or her own pace in accordance with the narrated instructions, said pace-setting means being further operative for thereafter restarting the animated feature and sound accompaniment when the child has completed the application of the applique means to the screen,

whereby each child can interact with the narrated instructions at his or her own pace.

4,373,919

MULTI-PASSAGE VARIABLE DIFFUSER INLET

Maynard L. Stangeland, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

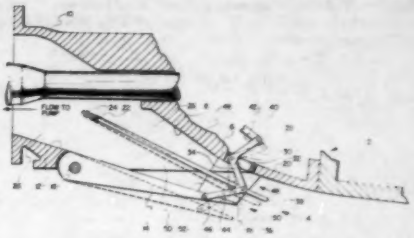
Filed Nov. 17, 1980, Ser. No. 207,116
Int. Cl.³ B63H *11/04*
U.S. Cl. 440—47 **4 Claims**

1. An inlet for a marine jet propulsion system comprising:

a lip member having one end thereof pivotally connected to the hull of a vessel;

a center splitter serving to divide said inlet into upper and lower passages;

positioning means for moving said splitter in a manner proportional to the movement of said lip to assure equality of the areas and diffusion of said upper and lower passages; and



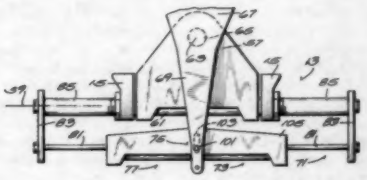
means for varying the outward projection of said splitter to vary the inlet velocity recovery of said upper and lower passages.

4,373,920

MARINE PROPULSION DEVICE STEERING MECHANISM

Charles B. Hall, Ingleside; Edward D. McBride, Waukegan, both of Ill., and Robert F. Young, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 28, 1980, Ser. No. 173,158
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—59 **38 Claims**

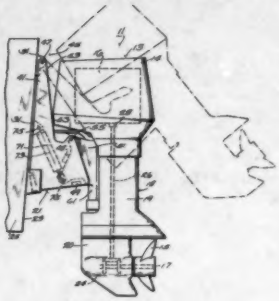


37. A marine propulsion device comprising a bracket adapted to be fixed relative to a boat transom, a propulsion unit including a steering arm, means pivotally connecting said bracket and said propulsion unit for vertical swinging movement of said propulsion unit about a first axis which is located below said steering arm and which is substantially horizontal when said bracket is boat mounted, and for swinging movement of said propulsion unit about a steering axis which is generally transverse to the first axis, a support member, spaced means supporting said support member so that said support member is located in spaced parallel relation to said first axis and is retained against movement axially of said first axis while permitting movement of said support member in an arc about said first axis in common with vertical swinging movement of said propulsion unit, a traveling member carried by said support member for movement therealong in directions parallel to said first axis, means connecting said traveling member and said steering arm for applying force to said steering arm so that said steering arm swings said propulsion unit about the steering axis in response to movement of said traveling member along said support member, and means on said support member and on said traveling member for reaction therebetween so as to selectively displace said traveling member along said support member to thereby steer said propulsion unit.

4,373,921
OUTBOARD MOTOR WITH SEQUENTIALLY OPERATING TILT AND TRIM MEANS

Charles B. Hall, Ingleside; Edward D. McBride, Waukegan, both of Ill., and Robert F. Young, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 28, 1980, Ser. No. 173,160
Int. Cl.³ B63H 21/26
U.S. Cl. 440—61 7 Claims

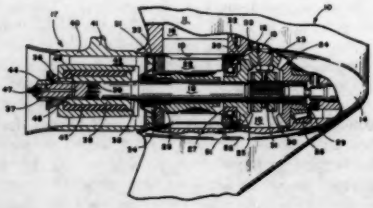


7. A marine propulsion device comprising a transom bracket means adapted to be connected to a boat transom, a stern bracket having an upper end, first pivot means connecting said upper end of said stern bracket to said transom bracket means for pivotal movement of said stern bracket relative to said transom bracket means about a first pivot axis which is horizontal and rearward of the transom when said transom bracket means is boat mounted, a swivel bracket, second pivot means connecting said swivel bracket to said stern bracket in spaced relation from said first pivot means and for pivotal movement of said swivel bracket relative to said stern bracket about a second pivot axis parallel to said first pivot axis, a propulsion unit including, at the lower end thereof, a rotatably mounted propeller, means connecting said propulsion unit to said swivel bracket for steering movement of said propulsion unit relative to said swivel bracket about a generally vertical axis and for common pivotal movement with said swivel bracket in a vertical plane about said first and second horizontal axes, and means for sequentially pivotally displacing said swivel bracket and connected propulsion unit about said second pivot axis and then about said first pivot axis.

4,373,922
OUTBOARD PROPULSION GEARCASE

Lyle E. Weed, Van Dyne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 21, 1980, Ser. No. 142,578
Int. Cl.³ B63H 1/20
U.S. Cl. 440—89 8 Claims



1. An engine driven outboard drive unit for attachment to a watercraft, comprising:

(A) a housing having a downwardly extending exhaust passage and a generally cylindrical horizontal bore which opens aft of said housing and receives exhaust gases from said passage;

(B) a propeller shaft mounted for rotation in said bore;

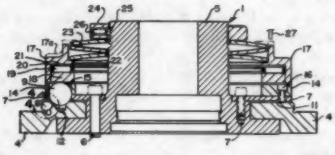
(C) a propeller mounted on said shaft at the aft end of said bore; and

(D) a bearing support member mounted in fixed relationship to said bore to support said shaft and to direct the exhaust gases rearwardly from said bore, said bearing support member and said bore having surfaces engaging each other to radially position said member in said bore, said engaging surface of said bearing support member having an array of depressions formed by a plurality of intersecting ridges and acting with said engaging surface of said bore to form closed pockets to retain lubricant between the engaging surfaces.

4,373,923
TORQUE LIMITING OVERLOAD COUPLING

Thomas C. Kilwin, Bridgeton, Mo., assignor to UMC Industries Inc., St. Louis, Mo.

Filed Dec. 14, 1979, Ser. No. 103,844
Int. Cl.³ F16D 7/02
U.S. Cl. 464—36 20 Claims



1. A torque limiting coupling assembly for use in retaining driving and driven means together during normal usage of machinery but effecting disconnection of said means when a maximum predetermined torque is exceeded, a rotating member for said assembly included in said driving means, a rotatable member included within said driven means of the assembly, the improvement which comprises, detent means, cooperating detent seats provided upon the rotatable member and for use in seating the said detent means, said detent means when seated within the said detent seats effecting a simultaneous turning of said driven means by the driving means during routine operation of the machinery and with the exertion of excessive torque causing an unseating of the detent means from within their seats and an incident reduction in the rotation of said driven means, a detent means suspension plate connecting within said rotating member of the driving means and providing for supporting said detent means for normal seating within the rotatable member seats, both the detent means support by the suspension plate and the detent seats of the rotatable member normally being in contact with the detent means only on that side of the detent means in contact with the said rotatable member.

4,373,924
TORQUE LIMITING CLUTCH

Ernst Schuhmacher, Bad Homburg, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jul. 1, 1980, Ser. No. 164,870
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931732
Int. Cl.³ F16D 19/00
U.S. Cl. 464—38 9 Claims

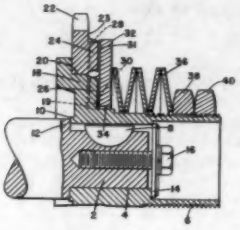
1. A rotary transmission assembly including a torque limiting slip clutch comprising:

a first transmission member having an at least partially radially extending clutch face including a clutching surface;

a second transmission member supported by and rotatable

relative to the first transmission member and including an at least partially radially extending clutch face including a clutching surface disposed radially outward of and of substantially the same clutching characteristics as the clutching surface of the first transmission member;

a clutch element having a clutch face facing the respective clutch faces of the first and second transmission members and including a clutching surface having inner and outer portions for mating respectively with the clutching surfaces of the first and second transmission members said mating including axially overlapping engagement of the respective surfaces; and



means for biasing the clutch element axially so that the respective clutching surfaces engage for transmitting torque between the first and second transmission members by way of the clutch element, the nature of the clutching surfaces being such that said torque transmission results in an axial separating force tending to axially separate and disengage the clutching surfaces of the clutch element from those of the transmission members and deflectably resisted by the bias means and so that, at a predetermined torque, the separation is such that at least one of the mating pairs of clutching surfaces disengage, permitting relative rotational movement between the first and second transmission elements.

4,373,925

ELASTIC COUPLING

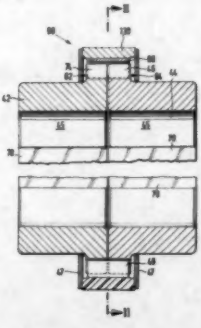
Kurt G. Fickelscher, Herderstr. 19, 671 Frankenthal, Pfalz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 943,358, Sep. 18, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 162,129

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742442; Jun. 21, 1979, 2924935

Int. Cl.³ F16D *3/54*

U.S. Cl. 464—158 **29 Claims**



1. In an elastic coupling with two similar central gears assemblable on respective shaft ends and having rows of teeth, respectively, disposed adjacent one another, and a planet gear with a row of teeth having an angular pitch equal to that of the rows of teeth of the central gears and engaging in tooth gaps of the central gears, the central gears being turnable elastically resiliently so that the flanks of the teeth of the central gears form generally wedge-shaped virtual tooth gaps having a profile varying with reciprocal turning of the central gears, the improvement therein which comprises the teeth of the central gear having flanks with planar surfaces, the teeth of the planet gear being rigid individual slide members, and being slidable in radial direction on the planar tooth flanks of the teeth of the central gears during load variation, and the planet gear containing spring means effective in radial direction, for spring-biasing the individual teeth of the planet gear radially into the appertaining tooth gaps.

4,373,926

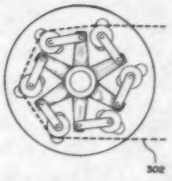
AUTOMATIC TRANSMISSION HAVING A CONTINUOUSLY VARIABLE DRIVE RATIO

Robert L. Fullerton, P.O. Box 4119, Incline Village, Nev. 89450

Filed Jul. 21, 1980, Ser. No. 170,529

Int. Cl.³ F16H *55/54*

U.S. Cl. 474—57 **2 Claims**



1. Automatic transmission apparatus for providing a continuously variable drive ratio comprising:

a pair of outer plates to which torque may be applied;

a sprocket support structure lying between the outer plates including a star wheel having a plurality of pairs of projections, each pair of projections carrying a pair of axle support arms;

bias means connected to the outer plates and to the sprocket structure for providing a rotational force between the outer plates and the sprocket support structure to vary the relative positions of the outer plates and the sprocket support structure in response to an applied torque; and

a plurality of sprocket wheels each having an axle, each axle being supported at two spaced apart locations along the axle's length by one of the pairs of axle support arms, the sprocket wheels being regularly spaced along the circumference of a circle defined by the positions of the sprocket wheel axles, the radius of the circle being continuously varied by the relative motion of the sprocket support structure and the outer plates.

4,373,927

TWO SPEED TRANSMISSION

John T. McKinley, Anderson, S.C., assignor to Foundry & Steel, Inc., Anderson, S.C.

Filed Aug. 25, 1980, Ser. No. 181,137

Int. Cl.³ F16H *9/00*

U.S. Cl. 474—74 **3 Claims**

1. A two-speed transmission comprising:

an input shaft,

a slow speed input pulley carried on and being fixed to said input shaft,

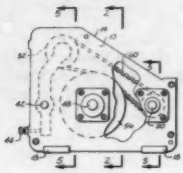
a high speed input pulley having a diameter greater than said slow speed pulley carried on and being fixed to said input shaft,

an output shaft,

an overrunning clutch carried on said output shaft;

a slow speed output pulley carried by said overrunning clutch,

a selectively engageable clutch carried on said output shaft,
a high speed output pulley carried by said selectively engageable clutch having a smaller diameter than said slow speed pulley carried by said overrunning clutch,
first and second idle pulleys,
said first timing belt extending around said slow speed input pulley and said first idle pulley with said teeth on said inner surface engaging said slow speed input pulley and said idle pulley, and said teeth on said outer surface being in driving engagement with said low speed output pulley,
said second timing belt extending around said high speed input pulley and said second idle pulley with said teeth on an inner



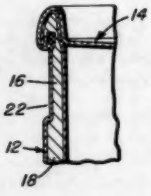
surface engaging said high speed input pulley and said idle pulley and said teeth on said outer surface being in driving engagement with said high speed output pulley,
a pair of pivotal arms;
each of said idle rolls being supported adjacent an end of a respective pivotal arm, and
adjustable means associated with said pivotal arms for tensioning said timing belts and maintaining the run of said belts substantially linear,
whereby when said input shaft is rotated at a constant speed, said output shaft can be selectively driven in an opposite direction at two distinct speeds either engaging or disengaging said selectively engageable clutch.

4,373,928

METHOD OF MAKING COMPOSITE CONTAINER WITH COMPRESSED BODY WALL

John D. Horton, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Feb. 13, 1981, Ser. No. 234,191
Int. Cl.³ B31B *49/02*
U.S. Cl. 493—103 **4 Claims**



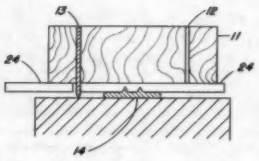
1. A method of forming a composite container for facilitating accommodation of the cutting blade and drive wheel of a conventional can opener, said method comprising the steps of forming a tubular composite body of constant internal diameter with opposed open ends, compressing a section of the wall of the body circumferentially about said body adjacent one of said ends and along a portion of the length of the body inwardly from said one of said ends while retaining the constant internal diameter of said body between said open ends and prior to any further end forming operation and in a manner defining a peripheral recess externally about said body, subsequently positioning a flanged metal end cap over said one of said ends, and forming the flange of the end cap and the compressed section adjacent said one of said ends into an interlocked seam permanently engaging said cap to said body.

4,373,929

METHOD AND APPARATUS FOR CUTTING AND SCORING FOLDING CONTAINER BLANKS

Paul W. Smith, 2351 N. 92nd, Omaha, Nebr. 68134

Continuation of Ser. No. 5,267, Jan. 22, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,331
Int. Cl.³ B31B *1/20, 1/25*
U.S. Cl. 493—355 **7 Claims**



1. A method for cutting blanks from rigid and semi-rigid material and scoring the blanks to provide creaseless fold lines, comprising,
providing a die face having knife edges protruding therefrom defining the general outline of a blank to be cut,
providing an elongated generally thin flat score forming material having at least two closely spaced substantially parallel ridges protruding from one surface thereof,
aligning and supporting said score forming material on said die face within the general outline defined by said knife edges and with said one surface and ridges of the score forming material facing said die face,
aligning a flat platen with said die face,
moving said die face and platen together thereby engaging said score forming material with said platen,
transferring said score forming material onto said platen in mirror image alignment,
separating said die face and platen,
placing material to be cut and scored between the die face and platen, and
moving said die face and platen together thereby penetrating said knife edges into one side of the material to be cut and scoring the opposite side thereof.

4,373,930

AQUEOUS DISPERSIONS OF COLORING MATERIALS: POLY-ALKYLENEOXY NAPHTHALENE DISPERSING AGENTS

Geoffrey R. Rothwell, Chadderton, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 184,974, Sep. 8, 1980, abandoned. This application Sep. 15, 1981, Ser. No. 302,397

Claims priority, application United Kingdom, Oct. 3, 1979, 7934326

Int. Cl.³ D06P *67/00*

U.S. Cl. 8—527 7 Claims

1. An aqueous dispersion of a finely-divided, inorganic or non-ionic, organic solid selected from the groups consisting of disperse dyestuffs, pigments, optical brightening agents and anthraquinone, containing a water-soluble, non-ionic dispersing agent which comprises naphthalene carrying, in the alpha or the beta position, a water-solubilising poly(C_2 to C_4 alkyleneoxy) chain containing from 5 to 15 C_2 to C_4 alkyleneoxy groups and otherwise free from substituents.

4,373,931

METHOD OF MEASURING AGGLUTINATING REACTION AND A REACTION VESSEL THEREFOR

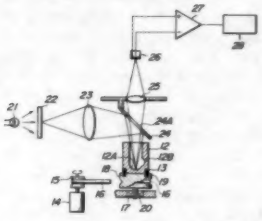
Hiroshi Takekawa, Kunitachi, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,625

Claims priority, application Japan, Oct. 9, 1979, 54-130280

Int. Cl.³ G01N *31/02, 1/10, 35/00*

U.S. Cl. 436—539 13 Claims



1. In a method of measuring an agglutination reaction by detecting an agglutination pattern due to an immunological agglutination reaction, the improvement comprising the steps of

introducing a reaction liquid containing corpuscles into a reaction vessel having a bottom and at least one recess formed in an inner sidewall thereof and smoothly communicated with the bottom;

rotating said reaction vessel about an axis thereof to collect at least a part of the reaction liquid in said recess for accelerating the agglutination reaction;

stopping the rotation of the reaction vessel to release the reaction liquid including agglutinated or non-agglutinated corpuscles from said recess into the bottom of the vessel due to gravity;

mixing the corpuscle-containing liquid with the reaction liquid contained in the bottom of the vessel so that, in case of agglutination, the agglutinated corpuscles settle on the bottom without being separated from each other, whereas in case of non-agglutination, the corpuscles are suspended in the reaction liquid; and

detecting the agglutination pattern formed on the bottom by the settled corpuscles.

8. A reaction vessel for measuring an agglutination reaction comprising:

a substantially tubular member comprising a cylindrical body having a side wall and a longitudinal axis;

an opening provided at an upper end of the cylindrical body;

a bottom wall having a generally concave inner bottom surface; and

a recess formed in said side wall, said recess having an inner surface which extends from the inner surface of the side wall of the cylindrical body, said recess having a central axis which is substantially perpendicular to the longitudinal axis of the cylindrical body for facilitating gravity flow of fluid from said recess back to said inner bottom surface.

4,373,932

APPLICATION OF WATER-DISPERSIBLE HYDROPHOBIC DYES OR PIGMENTS AS LABELS IN IMMUNOASSAYS

Thomas C. J. Gribnau, Haren; Frits Roeles, Dreumel, and Johannes H. W. Leuvering, Heesch, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 2, 1981, Ser. No. 222,263

Claims priority, application Netherlands, Jan. 11, 1980, 8000173

Int. Cl.³ G01N *33/54, 33/58, 33/76, 33/74*

U.S. Cl. 436—501 65 Claims

1. A process for the qualitative and/or quantitative determination of an immunochemically reactive component selected from the group consisting of a hapten, antigen, and antibody in an aqueous test medium using the immunochemical reactivity of said component comprising:

(1) providing a known amount of at least one labelled immunochemically reactive component obtained by the direct or the indirect attachment of an immunochemically reactive component to particles of an aqueous dispersion of (a) a hydrophobic dye or pigment or (b) polymer nuclei coated with said dye or pigment, said particles having a particle size of at least 5 nm;

(2) providing at least one non-labelled immunochemically reactive component;

(3) mixing said components (1) and (2) with a sample containing said test medium;

(4) allowing the immunochemical reaction to proceed to form free and bound labelled component(s);

(5) optionally separating the free and bound labelled component(s) in the test medium or in one of the fractions obtained after separation; and

(6) determining the nature and/or the quantity of the dye or pigment, said determination providing a qualitative and/or quantitative indication of the immunochemically reactive component(s) to be determined.

9. A test kit for the determination of one or more immunochemically reactive components in an aqueous medium, comprising:

(a) a known amount of at least one labelled immunochemically reactive component obtained by the direct or indirect attachment of an unlabelled immunochemically reactive component to particles of an aqueous dispersion of (i) a hydrophobic dye or pigment or (ii) polymer nucleic coated with said dye or pigment, said particles having a particle size of at least 5 nm,

(b) other immunochemical reagents, and

(c) directions for use of said test kit.

10. An immunochemical reagent consisting of an aqueous dispersion of particles of (a) a hydrophobic dye or pigment or (b) polymer nuclei coated with said dye or pigment directly or indirectly attached to an immunochemically reactive component, said particles having a particle size of at least 5 nm.

4,373,933

METHOD OF PRODUCING PRECISION ABRASIVE TOOLS

Alfred E. Grazen, 368 S. Main St., Deep River, Conn. 06417

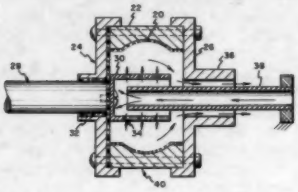
Filed May 15, 1981, Ser. No. 264,132

Int. Cl.³ C09C *1/68*

U.S. Cl. 51—309 10 Claims

1. A method of making a precision abrasive tool, which comprises

(a) depositing loose diamond particles in a metallic mold having an inner annular surface in an amount which is in excess of the number of particles needed to cover the inner annular surface of said mold.
(b) rotating said mold about its horizontal axis to spread said diamond particles evenly over the inner annular surface of said mold by centrifugal force rotating means,
(c) distributing by an electrolytic distributing means an electrolytic solution containing a metal into the rotating mold,
(1) wherein the mold annular surface has a negative charge forming a cathode.
(2) wherein the electrolytic solution distributing means has a positive charge forming an anode.



(d) forming a solidified matrix of metal by electrolytic deposition around the diamond particles on the inner annular surface of said mold,
(e) removing the diamond particles which are not contained within said matrix,
(f) continuing the buildup of the matrix to the desired thickness by electrolytic deposition,
(g) removing the mold from the rotating means, and introducing core material into the mold as backup for said matrix,
(h) machining the core material to desired dimensions,
(i) separating the mold from said matrix with the diamond particles and core material.

4,373,934

METAL BONDED DIAMOND AGGREGATE ABRASIVE

Stephen C. Hayden, Columbus, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Aug. 5, 1981, Ser. No. 290,131
Int. Cl.³ B24D *3/02*
U.S. Cl. 51—309 **5 Claims**

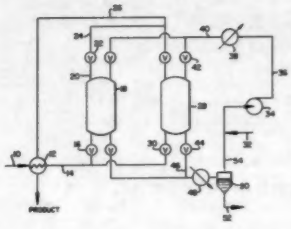
1. An improved aggregated abrasive particle comprising diamond particles held in a silver/copper alloy metal bond matrix which contains titanium as a wetting agent for diamond, wherein the improvement comprises those aggregates in which:
(a) the particle size of the diamonds, on the average, is less than or equal to 53 microns;
(b) the diamonds are characterized as milled saw diamond; and
(c) the meta bond matrix comprises 64 to 78 weight percent of the aggregate.

4,373,935

ADSORPTION SEPARATION CYCLE

Joseph P. Ausikaitis, White Plains, and Desh R. Garg, Hopewell Junction, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 1, 1981, Ser. No. 259,377
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—33 **11 Claims**



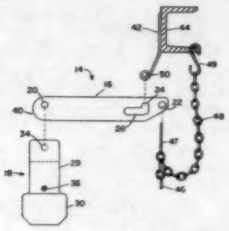
1. Adsorption separation process which comprises;
(a) passing in the vapor phase a feedstock comprising at least 2.5 weight percent water in admixture with at least one organic molecular species into a fixed adsorption bed at a temperature and pressure which prevents the capillary condensation of said organic molecular species, said fixed adsorption bed containing an adsorbent mass consisting essentially of a crystalline zeolitic molecular sieve adsorbent, small enough to substantially exclude the said organic molecular species, moving the water adsorption mass transfer front and the coinciding or trailing heat front created in said fixed bed along said bed toward the effluent end thereof to a predetermined point short of breakthrough of either of said fronts, at least that portion of said molecular sieve adsorbent contacted by said water mass transfer front containing adsorbed thereon, prior to and at the time of contact of said front, at least about 2 weight percent water, said molecular sieve adsorbent having a capacity for the adsorption of water under the imposed operating conditions greater than the water loading thereon at the time of contact by the water mass-transfer front;
(b) from the effluent end of said bed, recovering a product stream containing a lower concentration of water than the feedstock;
(c) terminating the flow of feedstock into said bed prior to breakthrough of either of the heat front and the water mass transfer front, and prior to substantial loss of the heat energy from the bed, commencing the countercurrent passage through said bed of an essentially non-sorbable purge gas at a temperature within about 25° F. of the temperature of, and substantially at the same pressure as, the feedstock entering the bed during adsorption step (a), said temperature and pressure being sufficient to prevent capillary condensation of the said organic molecular species of said feedstock, whereby said heat front is moved back through said bed and utilized in desorbing water from the adsorbent mass;
(d) continuing the countercurrent purging of said bed until the water loading on said adsorbate is essentially the same as at the beginning of adsorption step (a), and
(e) repeating adsorption step (a).

4,373,936

FILTER BAG TENSIONING DEVICE AND METHOD

Andrew R. Becker, Ellicott City, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 6, 1980, Ser. No. 175,376
Int. Cl.³ B01D 46/00
U.S. Cl. 55—97 17 Claims



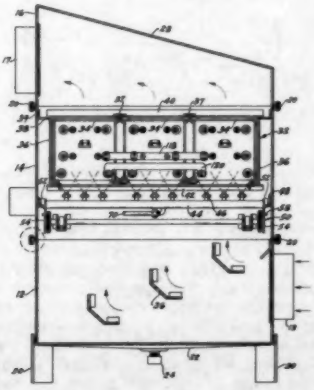
1. A method of attaching and replacing a filter bag in a bag house in which an elongated lever is pivotally supported intermediate its ends at a desired pivot point by a pivot affixed within the upper reaches of said bag house and said lever is provided with filter bag support means adjacent one end and a weight and weight securement means adjacent its other end comprising, rotating the weight securement end of said lever to a generally vertical disposition, moving the bag support end of said lever generally vertically downward, attaching a filter bag to the filter bag support means, rotating the weight securement end of said lever to a generally lateral position relative to said pivot and displacing said lever to said desired pivot point and, when said filter bag is to be replaced, repeating the above sequence of steps with removal of the existing filter bag and attachment of a new filter bag.

4,373,937

ELECTROSTATIC PRECIPITATOR WITH MODULAR CABINET AND CELL WASHER

James A. Krause, Harrison, Ark., and Edward A. Kitsch, Kirkwood, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 838,205, Sep. 30, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,465
Int. Cl.³ B03C 3/78, 3/82
U.S. Cl. 55—118 3 Claims



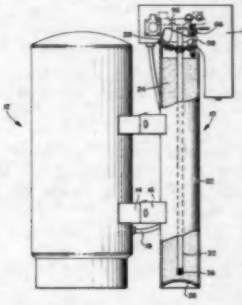
1. An electrostatic air cleaner comprising a cabinet having three vertically arranged and detachably connected sections, said sections being square in plan with four sidewalls of equal horizontal length, the upper of said sections having a top wall and an outlet opening in one sidewall thereof, the lower of said sections having a bottom wall and an inlet opening in one sidewall thereof, and the intermediate of said sections having an access opening in one sidewall thereof provided with at least one door for closing said opening, and said inlet and outlet openings being surrounded by flanges, means in said intermediate cabinet section slidably receiving a plurality of electrostatic precipitator cells which cells are enterable and removable through said access opening, the horizontal meeting edges of said cabinet section sidewalls being formed horizontally to provide meeting flanges, and means detachably connecting said meeting flanges whereby said lower inlet section and said upper outlet section may be assembled to said intermediate section with their respective inlet and outlet openings facing in any one of four directions with respect to said access opening in said intermediate section.

4,373,938

MODULAR INDUSTRIAL OXYGEN CONCENTRATOR

Norman R. McCombs, Tonawanda, N.Y., assignor to Greene & Kellogg, Incorporated, Tonawanda, N.Y.

Filed Sep. 11, 1981, Ser. No. 301,292
Int. Cl.³ B01D 53/04
U.S. Cl. 55—160 39 Claims



1. A machine for carrying out a pressure swing adsorption cycle for separating a selected gas out of a mixture of gases, said machine being built up of pre-assembled modules, said machine comprising a combined separation and control module adapted to output gas enriched in said selected gas, said combined separation and control module comprising at least one separation means adapted to separate said selected gas from said mixture, a pre-assembled valve and flow conduit module, means to mount said valve and flow conduit module on and in gas flow communication with said separation means, wherein said separation means comprises at least one pressure tank of generally elongated cylindrical configuration, and said tank comprising an inverted domed end member formed with a plurality of openings.

20. A machine for carrying out a pressure swing adsorption cycle for separating a selected gas out of a mixture of gases, said machine comprising at least one pre-assembled module comprising a combined bed and control module adapted to output gas enriched in said selected gas, said combined bed and control module comprising at least one separation means adapted to separate said selected gas from said mixture of gases, said bed and control module comprising housing means enclosing the control position of said at least one bed and control module, said housing means comprising a housing and a lid, means to removably mount said lid onto said housing in an airtight manner, means to deliver said mixture of gases to said separation means at a pressure greater than ambient atmospheric pressure, said housing being formed with an opening communicating the space inside said housing with the ambient

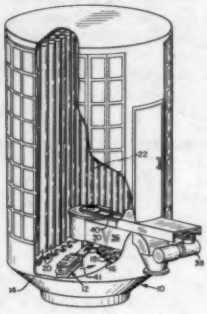
atmosphere, and said separation and control module comprising means to vent gases other than said selected gas inside said housing, whereby the space inside said housing is at a pressure of said ambient atmosphere.

4,373,939

AIR-FILTER VACUUM SWEEP APPARATUS

Craig F. Limbocker, P.O. Box 486, Sandy, Oreg. 97055

Filed Jul. 20, 1981, Ser. No. 285,151
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—287 **7 Claims**



7. An air-filter system including a plate having an array of openings, and a plurality of filter bags mounted on one side of said plate and communicating with said openings, wherein the improvement comprises,

a vacuum arm assembly mounted for recurrent movement over the other side of said plate, said assembly having an air-flow conduit terminating at one end in a port,

a vacuum head adapted for successive fluid-communicative registries with different ones of said openings, with such recurrent movement of said arm assembly, said vacuum head including a conduit head section having a mouth and throat, and

articulation means operatively coupling said head and said arm assembly enabling multidirectional articulation of the head relative to the assembly to accommodate pressure-biased sealed registry between said head and said openings with the arm and said plate in different relative positions, said articulation means including a flexible, fluid-tight skirt joining said port in said assembly in sealed fluid communication with said throat in said head section, said skirt accommodating limited multidirectional movement of said head section with respect to said assembly, and biasing means interposed between said assembly and said head section for biasing said head sections toward said other side of said plate.

4,373,940

AIR PRECLEANER FOR INTERNAL COMBUSTION ENGINE

Ross K. Petersen, Burleson, Tex., assignor to Medalie Manufacturing Co., Minneapolis, Minn.

Filed Jan. 29, 1982, Ser. No. 343,895
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—328 **10 Claims**

1. An air precleaning device, having in combination

a substantially cylindrical housing,

a directional hood structure carried by said housing having a chamber therein to the full extent thereof,

said hood having a relatively large inlet,

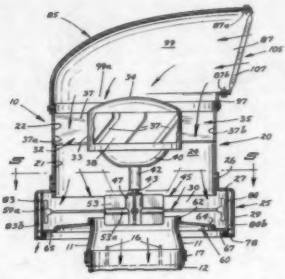
a louvered member forming said inlet,

a separation chamber within said housing underlying said hood structure,

an unrestricted passage between said chamber and said separation chamber,

a discharge chamber within said housing underlying said separation chamber,

a vane assembly carried by said housing disposed within said separation chamber centrifuging the air stream passing through said housing,



means forming a plurality of contaminant discharge passages at the periphery of said discharge chamber,

an impeller assembly disposed within said discharge chamber,

means within said housing securing said impeller assembly, and

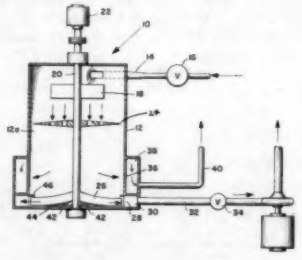
means carried by said impeller assembly discharging contaminants from said air stream to said discharge passages.

4,373,941

CENTRIFUGE SEPARATOR

Ernest Lagelbauer, 223 W. 21st St., New York, N.Y. 10011

Filed Feb. 13, 1981, Ser. No. 234,251
Int. Cl.³ B01D *59/20*
U.S. Cl. 55—401 **21 Claims**



1. Apparatus for separating a specifically lighter or heavier component from a flowing medium having suspended therein components of different densities, said components including gases and/or particles, the apparatus comprising at least one stationary vessel having an apertured partition means therein forming two zones and establishing an orderly flow pattern for the flowing medium, a first upper zone forming a whirling chamber in which the flowing medium is placed into coaxial rotational flow pattern, rotational means in said first zone for establishing said rotational flow pattern, and a second zone to which the flowing medium enters through the apertures in said partition means said zone having at least two discharge means, one of said discharge means being provided for withdrawing a fluid mixture which is rich in the lighter component and the other of said discharge means being provided for withdrawing a fluid mixture which is rich in the heavier component said

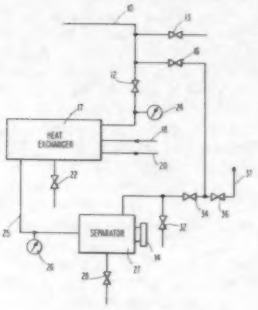
partition means having a multiplicity of minute orifices for establishing an orderly flow pattern.

4,373,942

CHLOROCARBON AND HALOGEN RECOVERY FROM VENT GAS STREAM

Danny W. Wright, Hickory, Ky., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 9, 1981, Ser. No. 232,747
Int. Cl.³ F25J 3/00
U.S. Cl. 62—12 **10 Claims**



1. A method of recovering chlorocarbons from a vent gas stream containing a chlorocarbon and halogen mixture, comprising:

cooling said gas at a pressure of at least 60 psig to a temperature below the freezing point of the chlorocarbon and halogen mixture;

transferring said cooled gas to a separation chamber to coalesce said mixture; and

separating the mixture in liquid form from said gas.

4,373,943

MULTIPLE FIBER FORMING MACHINE

Alain Gouronnec, Krec'h Lia Beg Leguer, Servel, 22300 Lannion; Andre Regreny, Parc ar Croas 17, rue Albert Camus, 22700 Perros Guirec, and Michel Treheux, An Tri Breud, rue des Iles L'Ile Grande, 22560 Pleumeur-Bodou, all of France

PCT No. PCT/FR80/00046, § 371 Date Nov. 29, 1980, § 102(e) Date Nov. 19, 1980, PCT Pub. No. WO80/02139, PCT Pub. Date Oct. 16, 1980
PCT Filed Mar. 26, 1980, Ser. No. 224,527
Claims priority, application France, Mar. 23, 1979, 79 07926
Int. Cl.³ C03B 37/025
U.S. Cl. 65—10.1 **6 Claims**

1. A multiple fibre forming machine permitting a simultaneous drawing of a plurality of N optical fibres and then a linear multifibre stranding, wherein it successively comprises:

(A) a first drawing assembly for a plurality of N fibres, said first assembly being constituted by:

(a) N regulatable preform supports associated with controlled speed lowering means;

(b) an assembly of N high temperature drawing enclosures, each receiving a preform and supplying a fibre;

(c) a system for the simultaneous coating of N fibres constituted by N opening spinnerets or extrusion dyes supplied by a coating product and traversed by the fibres;

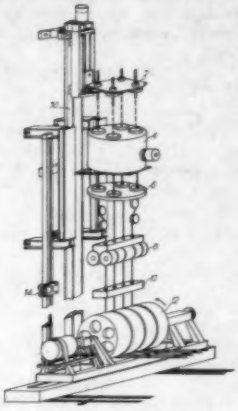
(d) a plurality of N pulling capstans, each receiving a fibre and being controlled in rotation by an appropriate means; and

(e) a system for measuring the diameter of the fibres controlling the fibre formation speed of said first assembly; and

(B) a second linear multifibre stranding assembly constituted by:

(f) a cable support supply system incorporating recesses for receiving at least one fibre;

(g) means for positioning the N fibres from the first drawing assembly in the recesses of the support;



(h) a system for coating the support with its fibres, said system supplying the cable; and

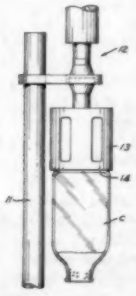
(i) a cable reception drum.

4,373,944

REMOVAL OF GLASS PARTICLES FROM GLASS ARTICLES

Frederick J. Glick, Williamstown, and Richard N. Pedersen, Vineland, both of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 10, 1981, Ser. No. 291,601
Int. Cl.³ C03C 19/00
U.S. Cl. 65—23 **9 Claims**



1. In a method of making hollow glass articles wherein the articles are subjected to an operation such that glass particles are deposited on the interior of the glass article, the improvement comprising the steps of removing such particles by directly contacting the glass article with a sonic resonator and subjecting the article to sonic vibrations having a frequency of about 0.5 to 90 kHz to remove the particles.

4,373,945

HERBICIDAL AGENTS BASED ON ACETANILIDES

Karl Eicken, Wachenheim, and Bruno Wuerzer, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 56,146, Jul. 9, 1979, Pat. No. 4,277,278. This application Nov. 24, 1980, Ser. No. 209,961

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832046

Int. Cl.³ A01N *43/26*

U.S. Cl. 71—92 2 Claims

1. A herbicidal agent comprising a mixture of 2-chloro-2',6'-dimethyl-N-(3,5-dimethylpyrazol-1-yl-methyl)-acetanilide as compound I and 2-chloro-2',6'-diethyl-N-(methoxymethyl)-acetanilide as compound II, and wherein the weight ratio of I to II is from 1:0.5 to 1:20.

4,373,946

PROCESS OF HEAT-TREATING PELLETS

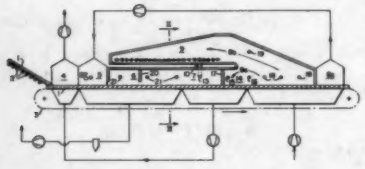
Alois Kilian, Frankfurt am Main, Fed. Rep. of Germany, assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1980, Ser. No. 214,525

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1979, 2949418

Int. Cl.³ C22B *1/20*

U.S. Cl. 75—5 9 Claims



1. In a process for heat-treating pellets on a grate in a pellet firing machine having a heat-treating zone and a cooling zone wherein hot and cool gases respectively are passed through a pellet bed in each zone, hot gases being generated both by combusting fuel including outside fuel added after all of the pellets enter the heat treating zone and by conducting to the heat treating zone cooling gases which are heated as they are passed through said pellet bed in said cooling zone, the improvement comprising the steps of: charging solid carbonaceous fuel comprising at least part of the outside fuel onto the upper surface of the pellet bed, and burning said carbonaceous fuel to generate at least a portion of said hot gases in said heat-treating zone, with said hot gases flowing downwardly through the pellet bed in at least a portion of the heat treating zone and said cooling gases flowing upwardly through the pellet bed in at least a portion of the cooling zone, said cooling gases being heated for transfer into said heat treating zone, and with the particle size distribution and charging location of said solid carbonaceous fuel on the upper surface of said pellet bed being selected such that at least some of the fuel particles are lifted from the surface of the bed in the cooling zone by the upwardly flowing cooling gases with the smaller particles being consumed while the gases flow toward the pellet bed in the heat-treating zone and with the larger particles falling onto the upper surface of the bed in the heat-treating zone where they continue to burn.

4,373,947

PROCESS FOR THE PREPARATION OF ALLOY POWDERS WHICH CAN BE SINTERED AND WHICH ARE BASED ON TITANIUM

Günter Böttner; Hans-Günter Domazer, and Horst Eggert, all of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,178

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017782

Int. Cl.³ C22B *5/04, 34/12;* C22C *1/04*

U.S. Cl. 75—0.5 BB 12 Claims

1. In a process for the preparation of an alloy powder which can be sintered and is based on titanium by the calciothermal reduction of oxides of the metals forming the alloys in the presence of inert additives, the improvement which comprises:

(a) mixing titanium oxide with the oxides of the other components of the alloy in amounts, based on the metals, corresponding to the desired composition of the alloy, adding an alkaline earth oxide or alkaline earth carbonate in a molar ratio of metal oxides to be reduced to alkaline earth oxide or alkaline earth carbonate of 1:1 to 6:1, homogenizing the mixture, calcining the homogenized mixture at temperatures of 1000° C. to 1300° C. for 6 to 18 hours, and cooling and crushing and milling the calcined mixture to a particle size of $\leqq 1$ mm;

(b) adding calcium in small pieces to the particles in an amount equivalent to 1.2 to 2.0 times the oxygen content of the oxides to be reduced, adding a booster in a molar ratio of oxide to be reduced to booster of 1:0.01 to 1:0.2, mixing the thus formed reaction batch, molding the mixture into green compacts and

(c) heating the green compacts in a closed off reaction crucible which was evacuated to an initial pressure of 1×10^{-4} to 1×10^{-6} bar, at a temperature of 1000° C. to 1300° C. for a period of 2 to 8 hours, and

(d) cooling the reaction product and crushing and milling it to a particle size of $\leqq 2$ mm, leaching out the calcium oxide with a suitable dissolving agent which does not dissolve the alloy powder, and washing and drying the alloy powder obtained.

4,373,948

ADDITION AGENTS FOR IRON-BASE ALLOYS

Gloria M. Faulring, Niagara Falls; Alan Fitzgibbon, Lewiston, and Frank Slish, Grand Island, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1981, Ser. No. 249,510

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—57 12 Claims

1. An addition agent for adding to molten iron-base alloys a metal selected from the group consisting of Nb, Mo, Cr and W, said addition agent consisting essentially of an agglomerated blended mixture of 20 to 80% by weight of about a finely divided oxide of one of said metals with about 20 to 80% by weight of a finely divided calcium bearing material selected from the group consisting of calcium-silicon alloy, calcium carbide and calcium cyanamide.

4,373,949

METHOD FOR INCREASING VESSEL LINING LIFE FOR BASIC OXYGEN FURNACES

Jerry V. Spruell, Grosse Ile, Mich., and Jennings B. Lewis, III, Putnam Valley, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

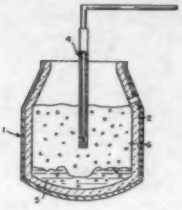
Continuation of Ser. No. 10,315, Feb. 7, 1979, abandoned. This application Aug. 21, 1981, Ser. No. 295,122

Int. Cl.³ C21C *5/34*

U.S. Cl. 75—60 10 Claims

1. A method for increasing the life of the refractory lining of a basic refractory-lined vessel for the production of steel comprising: blowing oxygen into a ferrous melt through an oxygen

lance from above the surface of the melt, introducing slag forming ingredients into said vessel, including amounts of dolomitic lime that do not substantially interfere with the ability of the slag to remove sulfur from said melt, said amounts of dolomitic lime constituting from 0 to 40 weight percent of the total slag forming ingredients, characterized by:



(a) introducing additional dolomitic lime into the vessel which would under conventional practice impair the sulfur removing ability of the slag by increasing slag viscosity, and

(b) introducing sufficient inert gas into the melt to counteract the increased slag viscosity by causing adequate mixing and agitation between the slag and the melt to remove the sulfur from the melt.

4,373,950

PROCESS OF PREPARING ALUMINUM OF HIGH PURITY

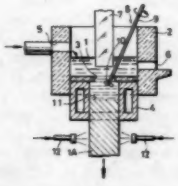
Hideo Shingu, Kyoto; Kozo Arai, and Ryotatsu Ootsuka, both of Osaka, all of Japan, assignors to Showa Aluminium Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1980, Ser. No. 195,125

Claims priority, application Japan, Oct. 9, 1979, 54-130505; Apr. 11, 1980, 55-48259

Int. Cl.³ C22B *21/06*

U.S. Cl. 75—68 R **5 Claims**



1. In melting aluminum containing impurities and solidifying the molten aluminum with the result of impurities being released in combination therewith a process for purifying aluminum comprising the steps of breaking down dendrites extending from the interface between the liquid phase and the solid phase of aluminum into the liquid phase by ultrasonic vibration to release impurities from between the dendrites or between the branches of the dendrites in the liquid phase, dispersing the released impurities in the entire body of the liquid phase by mechanically stirring the liquid phase to keep the interface smooth, and extracting only the highly purified aluminum.

4,373,951

NONMAGNETIC STEELS HAVING LOW THERMAL EXPANSION COEFFICIENTS AND HIGH YIELD POINTS

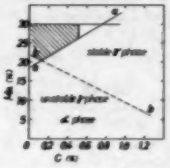
Chiaki Ouchi, and Yohji Kohsaka, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 104,754, Dec. 18, 1979, Pat. No. 4,256,516. This application Oct. 15, 1980, Ser. No. 197,138

Claims priority, application Japan, Dec. 26, 1978, 53-159206; Jan. 30, 1979, 54-8770

Int. Cl.³ C22C *38/02, 38/04, 38/34, 38/38*

U.S. Cl. 75—123 N **4 Claims**



1. Nonmagnetic steel having a low thermal expansion coefficient consisting of less than 0.5% by weight of C, less than 2% by weight of Si, 20 to 30% by weight of Mn, and 0.005 to 0.04% by weight of N and the balance iron and impurities, wherein the following relationships between the amounts of C and Mn are simultaneously satisfied

$$Mn(\%) > 16 \times C(\%) + 18$$

$$Mn(\%) > -12 \times C(\%) + 21.5.$$

4,373,952

INTERMETALLIC COMPOSITE

Edward D. Parent, Hamilton, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 19, 1981, Ser. No. 313,002

Int. Cl.³ B22F *3/14*; C22C *1/05*

U.S. Cl. 75—244 **6 Claims**

1. A hot pressed intermetallic composite comprised of titanium diboride and boron nitride and including tungsten in an amount of from about 0.1% to 20% by weight and having a density of at least 85% of theoretical.

4,373,953

SURFACE-COATING COMPOSITIONS CONTAINING POLYVALENT METAL SALTS OF HYDROXYBENZOIC ACID ESTERS

Adolph J. Deinet, East Brunswick, and William B. Woods, Lebanon, both of N.J., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Apr. 6, 1981, Ser. No. 251,678

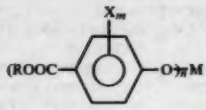
Int. Cl.³ C09D *5/14*

U.S. Cl. 106—16 **12 Claims**

1. A surface-coating composition having improved resistance to attack by fungi and other microorganisms that comprises

(a) a water-insoluble resinous binder selected from the group consisting of synthetic linear addition polymers prepared by the emulsion polymerization of ethylenically-unsaturated monomers, oleoresinous binders, and mixtures thereof and

(b) 0.1% to 3%, based on the weight of the composition, of a biocidal compound having the structural formula



wherein the R's may be the same or different and each R represents an alkyl, aryl, aralkyl, alkaryl, or alicyclic group having 1 to 10 carbon atoms; X represents hydrogen, chlorine, bromine, nitro, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms, M represents an environmentally-acceptable metal having a valence of 2, 3, or 4; m is 1 or 2; and n is the valence of the metal M.

4,373,954

RECORDING LIQUID AND METHOD FOR PRODUCING THE SAME

Tsuyoshi Eida, Chiba; Yasuhiro Yano, Naka; Yohji Matsufuji, Tokyo; Masahiro Haruta, Funabashi, and Tokuya Ohta, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,306
Int. Cl.³ C09D *11/02*
U.S. Cl. 106—20 **16 Claims**

1. A recording liquid comprising an aqueous composition of a water-soluble dye as the recording agent, wherein said liquid has a total concentration of halogen ions and acid radicals within the range from 0.00001 to 0.5% by weight.

4,373,955

LIGHTWEIGHT INSULATING CONCRETE

James P. Bouchard, Hinsdale, and John D. Farrell, Plainfield, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 4, 1981, Ser. No. 317,988
Int. Cl.³ C04B *1/00, 7/02*
U.S. Cl. 106—88 **14 Claims**

1. A method of producing a foamed insulating concrete consisting essentially of incorporating a hydrolyzed protein based aqueous foam in a slurry of portland cement, pumice, silica, pulping waste liquor and water to form a foamed concrete slurry of the following amounts of ingredients:

Portland cement—80 to 95 parts by weight,
Pumice—1 to 15 parts by weight,
Silica—0.5 to 5 parts by weight,
Pulping sulfite waste liquor—0.2 to 2 parts by weight,
Hydrolyzed protein based aqueous solution—2 to 4 parts by weight,
Water—45 to 60 parts by weight,

and then curing the concrete slurry to a solid rigid concrete.

4,373,956

ADDITIVE FOR HYDRAULIC CEMENT MIXES

Philip A. Rosskopf, South Euclid, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Sep. 14, 1981, Ser. No. 301,904
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—90 **18 Claims**

1. A hydraulic cement mix comprising a hydraulic cement, aggregate in an amount of up to 80% by weight based upon the total weight of said cement mix, sufficient water to effect hydraulic setting of the cement, and an additive comprising a mixture of an alkali and/or alkaline earth or ammonium salt of thiocyanic acid in an amount of between 0.05% and 2.5% by weight based upon the weight of the cement and an alkanolamine in an amount of between 0.001% and 0.05% by weight based upon the weight of the cement, whereby the rate of hardening of said cement mix is accelerated and the early compressive strength of the hardened mix is increased.

4,373,957

FIBRE-REINFORCED CEMENTITIOUS PRODUCT

Peder Pedersen, Hedehusene, Denmark, assignor to Rockwool International A/S, Hedehusene, Denmark

Continuation of Ser. No. 121,154, Feb. 13, 1980, abandoned.
This application Jul. 29, 1981, Ser. No. 288,120
Claims priority, application Denmark, Feb. 14, 1979, 631/79
Int. Cl.³ C04B *7/353*
U.S. Cl. 106—93 **7 Claims**

1. A fibre-reinforced cementitious product comprising a matrix of cementitious material and 3 to 13% by weight, based on the total weight of the cementitious product, of a fibrous material comprising a mixture of rock wool fibers and a sufficient amount of hemp fibers to provide a final product having an average minimum bending strength of 176 ± 17 kg/cm^2 at 1.7 g/cm^3.

4,373,958

ROAD BASE STABILIZATION USING LIME KILN DUST

Dennis A. Jones, Marietta, and Bruce E. Boggs, Roswell, both of Ga., assignors to JTM Industries, Inc., Marietta, Ga.

Filed Jan. 6, 1982, Ser. No. 337,221
Int. Cl.³ C04B *1/00*
U.S. Cl. 106—118 **6 Claims**

1. An essentially two-part road base stabilization mix comprising lime kiln dust as a by-product of manufacturing pebble lime from relatively high purity limestone having, in the lime kiln dust, no more than 10% magnesium oxide and having in excess of 30% calcium oxide, and an aggregate, in which the lime kiln dust comprises about 3% to about 30% by weight of the total mix.

4,373,959

READILY DISSOLVABLE POLYSACCHARIDE COMPOSITIONS

Gregory E. Socha, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 22, 1981, Ser. No. 276,437
Int. Cl.³ C08L *1/08*
U.S. Cl. 106—194 **13 Claims**

1. A polysaccharide composition comprising a dry blend of (a) a particulate aqueous liquid soluble, polysaccharide or polysaccharide derivative having essentially no cross-linkages which forms substantial amounts of soft lumps, nodules or other agglomerations upon addition to water at ambient conditions and (b) a particulate polysaccharide or polysaccharide derivative being sufficiently cross-linked such that the cross-linked polysaccharide or polysaccharide derivative does not form soft lumps, nodules or other agglomerations upon its addition to water; said uncross-linked polysaccharide or derivative and cross-linked polysaccharide or derivative being employed in amounts such that upon the composition's dispersion and subsequent dissolution in an aqueous solution at ambient temperature, the uncross-linked polysaccharide or derivative thereof does not form substantial amounts of soft lumps, nodulus or other agglomerations and the viscosity of the aqueous liquid is increased at a sufficient rate that the cross-linked polysaccharide is maintained in dispersion without significant amounts thereof settling prior to dissolution.

4,373,960

ASPHALT COMPOSITIONS AND METHOD FOR PAVING

Arthur T. Ward, Jr., 4 Blythewood Rd., Baltimore, Md. 21210

Filed Nov. 10, 1980, Ser. No. 205,151
Int. Cl.³ C08L *95/00*
U.S. Cl. 106—281 R **28 Claims**

1. A non-emulsified asphalt binder composition comprising:

(1) a medium curing liquid asphalt; (2) from about 0.1 to 13.5% tall oil based on the weight of medium curing asphalt and (3) 0.0001 to 0.05% by volume of an organopolysiloxane fluid, based on the volume of medium curing liquid asphalt plus tall oil.

19. A non-emulsified sealing composition comprising a rapid curing liquid asphalt and from about 0.1 to 13.5% tall oil, based on the weight of the rapid curing liquid asphalt.

4,373,961

PROCESS AND COMPOSITION FOR USE IN RECYCLING OF OLD ASPHALT PAVEMENTS

Eugene M. Stone, Denver, Colo., assignor to Penelizer Corporation, Commerce City, Colo.

Filed Oct. 13, 1981, Ser. No. 310,837

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ C08L *95/00*

U.S. Cl. 106—281 R **24 Claims**

1. An asphalt base stock for use in recycling old asphalt pavements into new pavements, said asphalt base stock having the following physical properties.

(1) a penetration in the range of from about 10 to about 50 measured at 77° F.,

(2) a softening point below about 160° F.,

(3) a ductility in excess of three times the penetration, in centimeters at 77° F. when pulled at the rate of 5 centimeter per minute, wherein said asphalt base stock comprises, (1) an asphalt pitch having a penetration of less than about 25 and a softening point in the approximate range of 185° F. minus three times the penetration and (2) an asphalt cement having a penetration between about 60 and about 300.

4,373,962

SURFACE TREATED ALKALI BLUE PIGMENT

Doreswamy R. Iyengar, Holland, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 8, 1981, Ser. No. 271,438

Int. Cl.³ C09B *48/00*; C09C *3/68*

U.S. Cl. 106—288 Q **12 Claims**

1. A process for preparing a soft textured high strength Alkali Blue pigment composition consisting of tertiary amines and untreated Alkali Blue wherein the Alkali Blue pigment in the form of a regular, untreated presscake, produced by phenylation with aniline of parafuchsin, sulfonation, primarily mono, with sulfuric acid and subsequent precipitation of the caustic solution in mineral acid to obtain pigmentary properties followed by filtration and washing, is dispersed in water which comprises mixing said dispersion with (a) an aqueous solution of a tertiary amine acetate and (b) sufficient ammonium hydroxide to precipitate said amine onto the pigment, and recovering said pigment composition.

7. A process for preparing a soft textured high strength Alkali Blue pigment composition consisting of insoluble tertiary amines and Alkali Blue pigment wherein the Alkali Blue pigment in the form of a regular, untreated presscake, produced by phenylation with aniline of parafuchsin, sulfonation, primarily mono, with sulfuric acid and subsequent precipitation of the caustic solution in mineral acid to obtain pigmentary properties followed by filtration and washing, is dispersed in water which comprises mixing said dispersion with (a) an aqueous emulsion/dispersion of tertiary amine and (b) recovering said pigment composition.

4,373,963

LUSTROUS PIGMENT AND PROCESS FOR PRODUCING SAME

Toshiaki Uenishi; Hidefumi Harada; Katumasa Sasaki; Akio Akagi, and Takanori Yamasaki, all of Ube, Japan, assignors to Titan Kogyo K.K., Japan

Filed Sep. 3, 1981, Ser. No. 299,244

Int. Cl.³ C09C *1/24*; C08K *7/00*; C01F *7/02*

U.S. Cl. 106—304 **12 Claims**

1. A lustrous flake pigment having a grain structure of red iron oxide containing aluminum oxide in solid solution.

4,373,964

ASSISTANTS FOR THE PREPARATION OF PIGMENT PASTES AND HIGH-CONCENTRATION, LOW VISCOSITY PIGMENT PASTES

Heinrich Linden; Hans Bornmann, both of Düsseldorf-Holthausen; Wolfgang Gress, Wuppertal-Elberfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 180,816, Aug. 25, 1980, abandoned. This application Aug. 7, 1981, Ser. No. 290,826

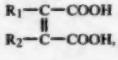
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1979, 2934528

Int. Cl.³ C09D *3/64*

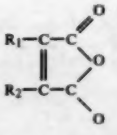
U.S. Cl. 106—308 Q **7 Claims**

1. The process for the preparation of high concentration, low viscosity liquid pigments pastes consisting essentially of mixing inorganic pigments, a substantially, non-volatile liquid organic media, a suspension assistant, and, optionally, inorganic fillers, wherein said liquid pigment pastes have a concentration of inorganic pigment of at least 50% and said suspension assistant is present in an amount of from 0.5% to 20% by weight, based on the weight of said inorganic pigment and is a reaction product of the reaction of:

(A) unsaturated acidic compounds selected from the group consisting of itaconic acid, an ethene dicarboxylic acid having the formula:



and an ethene dicarboxylic acid anhydride having the formula:



wherein R_1 and R_2 are members selected from the group consisting of hydrogen and methyl, and

(B) an unsaturated ester having the formula:

wherein R_3 and R_4 are members having 14 to 20 carbon atoms selected from the group consisting of alkenyl, alkadienyl, alkatrienyl and mixtures thereof, and A represents the acyl of an acid selected from the group consisting of itaconic acid, said ethene dicarboxylic acid, and an alkanedioic acid having the formula:

$$HOOC-(CH_2)_n-COOH$$

wherein n is an integer from 1 to 10, which reaction product is produced by heating said component A and said component B in a weight ratio of 1:7 to 1:35 for from 1 to 25 hours at a temperature in the range of 200° C. to 250° C.

4,373,965

SUPPRESSION OF PARASITIC SIDEWALL TRANSISTORS IN LOCOS STRUCTURES

Thomas S. Smigelski, Chicago, Ill., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 22, 1980, Ser. No. 219,015
Int. Cl.³ H01L *21/302, 21/26*
U.S. Cl. 148—1.5 **5 Claims**

1. An improved process for forming, in a substrate, a recessed isolation oxide layer and a buried impurity layer beneath the oxide layer, comprising:

forming a mask structure having a first, oxidation window and a second, implant window overlying the first window, the second window being wider than the first window for controlling the formation of the impurity layer such that the impurity layer spans the underside of the edge of the isolation oxide layer;

forming the impurity layer by implanting the substrate via the second window; and

forming the isolation oxide layer by oxidizing the substrate via the first window.

4,373,966

FORMING SCHOTTKY BARRIER DIODES BY DEPOSITING ALUMINUM SILICON AND COPPER OR BINARY ALLOYS THEREOF AND ALLOY-SINTERING

Sang U. Kim, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,311
Int. Cl.³ H01L *7/00*
U.S. Cl. 148—1.5 **7 Claims**

1. A method of forming a Schottky diode comprising the steps of

depositing a layer of copper doped silicon on a silicon body

depositing a layer of aluminum on said copper doped silicon layer, and

sintering the entire unit.

4,373,967

PROCESS FOR MAKING RESULFURIZED MACHINABLE STEEL

Charles R. Roper, Jr., Coatesville; John K. Strattan, Downingtown; Roy Hetherington, Jr., West Chester, and Austin J. Hiller, Coatesville, all of Pa., assignors to Lukens, Inc., Coatesville, Pa.

Division of Ser. No. 28,435, Apr. 9, 1979, abandoned. This application Aug. 5, 1980, Ser. No. 174,760
Int. Cl.³ C21D *7/00*
U.S. Cl. 148—2 **3 Claims**

1. In a process for making a resulfurized free-cutting carbon steel plate which is free of lead and other toxic elements such as selenium and tellurium and is substantially free of oxide inclusions of alumina and silicates, the process including the steps of producing a melt which is free of lead and other toxic elements and is composed of iron, manganese and carbon in ratios for free-cutting carbon steel, with sulfur being included at about 0.15 percent, adding silicon and aluminum as necessary to fully deoxidize the molten metal, adding silica and alumina as slag conditioners in the ladle as sufficient to produce a low ladle slag V-ratio (CaO to SiO_2) of approximately two to one, tapping the molten metal into the ladle, treating the molten metal in the ladle by a calcium-argon-blowing process wherein calcium carbide and calcium-silicon are injected into the molten metal in an argon stream at a rate of about two pounds of contained calcium per ton of molten metal over a period of five to ten minutes as sufficient to reduce the sulfur content to 0.07 to 0.15%, substantially removing silicate and alumina inclusions, thereafter casting said molten metal into an ingot or continuous cast slab.

2. A method in accordance with claim 1 wherein said ingot or slab is reduced by rolling to a plate which has a thickness not greater than twelve inches.

4,373,968

COATING COMPOSITION

Susan V. Hess, Norristown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Jun. 24, 1981, Ser. No. 276,881
Int. Cl.³ C23F *7/24*
U.S. Cl. 148—6.2 **23 Claims**

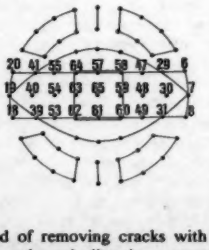
1. In a coating composition of the type which is effective in forming on a metallic surface a corrosion-resistant coating and which comprises an acidic aqueous coating solution containing hexavalent chromium, reduced chromium and dispersed acrylic resin solids, and of the type which, when applied to a substrate by an applicator roll, tends to deposit on the roll excessive amounts of chromium, the improvement comprising inclusion in the composition of an alkylphenoxypoly(alkyleneoxy)ether surfactant in an amount sufficient to deter said excessive chromium build-up.

4,373,969

METHOD OF REMOVING CRACKS, AND MULTIPLE-SHAPE TORCH FOR CARRYING OUT THE METHOD

Michel Donze, Essey-les-Nancy, France, assignor to Etablissements Somalor-Ferrari "Somafer", Uckange, France

PCT No. PCT/FR81/00005, § 371 Date Jul. 30, 1981, § 102(e) Date Jul. 30, 1981, PCT Pub. No. WO81/01973, PCT Pub. Date Jul. 23, 1981
PCT Filed Jan. 14, 1981, Ser. No. 287,743
Claims priority, application France, Jan. 18, 1980, 80 01555
Int. Cl.³ B23K *7/06*
U.S. Cl. 148—9.5 **7 Claims**



1. A method of removing cracks with an oxygen jet of adjustable strength and direction, surrounded by heating flames, the cross section of said jet being variable characterized in that during the crack removal process the shape of the cross

section of the jet is varied independently of its strength to adapt to the area surface of the cracks.

4,373,970

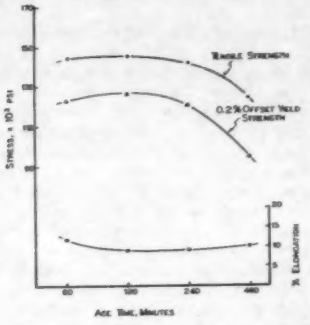
COPPER BASE SPINODAL ALLOY STRIP AND PROCESS FOR ITS PREPARATION

Clive R. Scorey, and Roy A. Smith, both of Cheshire, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,341

Int. Cl.³ C22F *1/08*; B22F *3/16*

U.S. Cl. 148—11.5 C **34 Claims**



1. A process for preparing copper base spinodal alloy strip having good strength properties in combination with good ductility, which comprises:

(a) providing a copper base alloy powder containing from about 5 to 35 percent nickel, from about 7 to 13 percent tin, balance copper;

(b) compacting the alloy powder to form a green strip having structural integrity and sufficient porosity to be penetrated by a reducing atmosphere;

(c) sintering the green strip in the reducing atmosphere to form a metallurgical bond; (d) cooling the sintered strip at a rate to prevent agen hardening and embrittlement; (e) rolling the cooled sintered strip to substantially fully dense final gage; and (f) finally annealing the rolled strip and quenching it at a rate sufficient to retain substantially all alpha phase.

4,373,971

PROCESS FOR THE PRODUCTION OF FERRITIC STAINLESS STEEL SHEETS OR STRIPS AND PRODUCTS PRODUCED BY SAID PROCESS

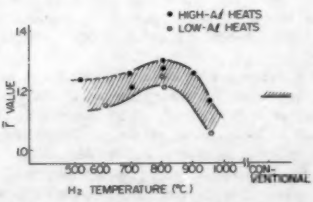
Tadashi Sawatani; Mitsuo Ishii, both of Hikari, and Hirofumi Yoshimura, Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 6, 1981, Ser. No. 222,762

Claims priority, application Japan, Jan. 11, 1980, 55-1883

Int. Cl.³ C21D *8/02*, *9/46*

U.S. Cl. 148—12 EA **9 Claims**



1. A process for the production of a ferritic stainless steel sheet or strip, characterized by carrying out a continuous annealing process comprising heating a hot rolled steel sheet or strip of an Al-containing ferritic stainless steel at a temperature of from 850° to 1100° C., hereinafter referred to as H_1 temperature, by continuous annealing, then precipitating aluminum nitride, in a dispersed state, by cooling the strip down to a temperature of from 700° to 900° C., hereinafter referred to as H_2 temperature, performing subsequent cooling to a level not higher than 200° C. at such a cooling rate that a chromium depletion layer, which may cause a gold dust defect, is not formed, and carrying out cold rolling and recrystallization annealing in combination until the sheet or strip thickness is reduced to desired gauge thickness.

4,373,972

PRODUCTION OF NICKEL BAR AND ROD

Sidney A. Burgin, and David J. Latham, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Dec. 1, 1981, Ser. No. 326,402

Claims priority, application United Kingdom, Dec. 2, 1980, 8038656

Int. Cl.³ C21D *9/00*

U.S. Cl. 148—12 B **6 Claims**

1. A method of producing nickel steel rod or bar of a composition including at least 4% by weight nickel and less than 0.2% by weight carbon, which method comprises the step of cooling a rod or bar of such composition on leaving a rolling mill at a rate which is controlled to produce in the cooled rod or bar a micro-structure which is predominately martensitic.

4,373,973

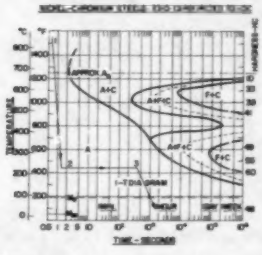
METHOD OF MANUFACTURE OF HIGH PERFORMANCE GEARS

Raymond A. Cellitti, Hinsdale, Ill., and John A. Halgren, Hilltop Lakes, Tex., assignors to International Harvester Co., Chicago, Ill.

Filed Nov. 16, 1981, Ser. No. 321,515

Int. Cl.³ C21D *9/32*

U.S. Cl. 148—12.4 **7 Claims**



1. Method of shaping gear teeth of a high performance gear, comprising the steps of:

(a) heating a hobbed gear blank having carburized gear teeth surfaces above its critical temperature to obtain a metastable austenitic structure throughout its carburized case;

(b) isothermally quenching said gear blank at a rate greater than the critical cooling rate of its carburized case to a uniform metastable austenitic temperature just above the martensitic temperature transformation;

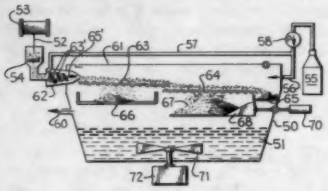
(c) holding the temperature of said gear blank in said uniform temperature range while rolling said gear teeth surfaces to a desired shape before martensitic transformation occurs; and

(d) cooling said gear through the martensitic range for the carburized gear surfaces to harden said gear surfaces.

4,373,974
SOLDER COMPOSITION

Felix Barajas, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 2, 1981, Ser. No. 250,209
Int. Cl.³ B23K 35/34
U.S. Cl. 148—24 25 Claims

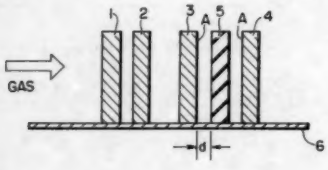


1. A solder composition especially adapted for soldering components in electronic circuitry, whereby following soldering essentially no solder balls are formed, said solder composition comprising finely divided solder metal dispersed in a liquid vehicle containing (a) a thixotropic agent, (b) an organic solvent and (c) a rosin type flux, the particle size of said metal ranging from 40 to 70 microns, said liquid vehicle being present in an amount of 13 to 14%, and said solder metal being present in an amount of 86 to 87%, by weight of said composition.

4,373,975
METHOD OF DIFFUSING AN IMPURITY

Mitsuo Nanba, Hinondemachi; Masahiko Ogirima, Tokyo; Hirotsugu Kozuka, Sekimachi, and Akira Shintani, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,476
Claims priority, application Japan, Jan. 30, 1980, 55-8809
Int. Cl.³ H01L 21/223
U.S. Cl. 148—189 25 Claims



1. A method of diffusing antimony in the formation of a semiconductor device comprising the step of arranging alumina and/or aluminum in the vicinity of a wafer surface in which an antimony diffused layer is to be formed, and the step of diffusing antimony from its vapor phase, said antimony being diffused with no appreciable diffusion of aluminum.

4,373,976
GUN PROPELLANT CONTAINING NITROAMINOGUANIDINE

Joseph E. Flanagan, Woodland Hills, and Vernon E. Haury, Simi, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 9, 1977, Ser. No. 775,823
Int. Cl.³ C06B 25/34
U.S. Cl. 149—92 1 Claim

1. A gun propellant comprising:
Nitroaminoguanidine—50–80 percent
Nitrocellulose (12.6% N)—15–40 percent
Cyclotetramethylene tetranitramine—0–30 percent
Inert Plasticizer triacetin or isodecylpelarganate—0–15 percent.

4,373,977
METHOD OF MAKING A COMPOSITE WIRE

Frederick Rothwarf, London, England, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 25, 1981, Ser. No. 277,365
Int. Cl.³ H01B 13/22, 7/28
U.S. Cl. 156—51 7 Claims

1. Method of making a high strength, lightweight composite wire, said method including the steps of:

(A). intercalating graphite fiber manufactured in continuous fibers many kilometers in length with a solution of a material that will impart high electrical conductivities to the fiber selected from the group consisting of strong acid fluorides, metal chlorides, metal bromides, and metal fluorides,

(B) coating the intercalated fiber with titanium as a wetting agent by means of vacuum evaporation,

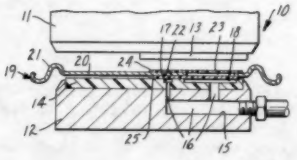
(C) placing the coated intercalated graphite fiber into a molten bath of a material selected from the group consisting of magnesium, copper substituted $Mg_{17}Al_{12}$alloy and zinc substituted $Mg_{17}Al_{12}$alloy, and,

(D) producing a composite wire by extrusion through a suitable die.

4,373,978
BONDING DEVICES AND METHODS FOR BONDING TAPE CLOSURES TO A CONTAINER END

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 18, 1981, Ser. No. 264,832
Int. Cl.³ B65D 17/14
U.S. Cl. 156—69 4 Claims



1. A device for bonding predetermined lengths of tape to a container end having a preformed opening, said device comprising:

(a) heat-activating first means for adhesively attaching a heat-activated first tape to one side of said container end circumjacent said preformed opening, said heat-activating first means comprising a heated, substantially planar bonding surface; and

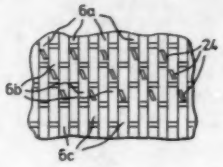
(b) second means for adhesively attaching a second tape to the opposite side of said container end circumjacent said preformed opening, said second means including means for adhesively attaching said second tape to said container end and compressed air means for deforming said second tape into the cavity of said preformed opening such that said second tape contacts and is adhered to said heat-activated first tape in the region of said preformed opening, said compressed air means employing compressed air acting on said container end in a sealed area.

4,373,979

SEALED BAGS OF PLASTIC MATERIALS

Mirek Planeta, Burlington, Canada, assignor to Workman Bag Company Ltd., Montreal, Canada

Filed Sep. 26, 1980, Ser. No. 191,119
Int. Cl.³ B29D 23/10; B32B 31/20
U.S. Cl. 156—73.1 4 Claims



1. A method of sealing together a first member and a second member of plastics material, at least one of which members is a fabric comprising a first plurality of parallel strips interwoven with a second plurality of parallel strips at right angles to the said first plurality, the strips of each plurality being of the same width and being of oriented plastics material whose orientation and strength are adversely affected by heat, said method comprising the steps of:

overlapping respective portions of said first member and said second member at the location of the joint to be formed between them,

applying to said overlapping portions at least two parallel rows of ultrasonic spot welds in a specific pattern wherein the rows of spot welds are parallel to the first plurality of parallel strips, the rows are spaced apart from one another a distance corresponding to the width of the strips of the first plurality, or a multiple thereof, the spot welds of each row are spaced apart a distance corresponding to the width of the strips of the second plurality times the number of rows, or a multiple thereof, and the immediately adjacent spot welds of the two rows are staggered relative to one another along the length of the respective rows whereby the said immediately adjacent spot welds are on different strips of the second plurality.

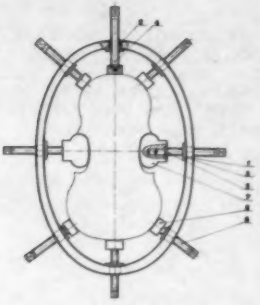
4,373,980

METHOD OF MANUFACTURE OF SOUND BOX OF STRINGED INSTRUMENTS, PARTICULARLY VIOLINS

Bogdan Skalmierski, Gliwice, and Krzysztof Mroz, Radkow, both of Poland, assignors to Politechnika Slaska im. Wincentego Pstrowskiego, Gliwice, Poland

Filed Jan. 30, 1981, Ser. No. 230,271
Claims priority, application Poland, Feb. 8, 1980, 221943; May 16, 1980, 224327
Int. Cl.³ G10D 1/02; B32B 31/00
U.S. Cl. 156—160 1 Claim

1. A method of manufacturing a sound box of a stringed musical instrument, particularly a violin, comprising subjecting the top and bottom plates of the sound box to stress causing an arc-shaped configuration having a curvature opposite to the curvature normally produced by the stretched strings of the finished instrument, preliminarily bending side members to form a side rim and cementing battens thereto, elastically bending said side rim to the desired final configuration, bonding said top and bottom plates to said side rim, and releasing



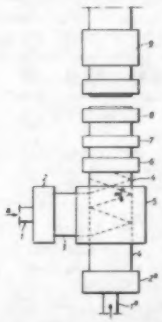
said stress, whereby said top plate is tensioned to produce improved acoustical properties in the sound box.

4,373,981

PROCESS FOR THE MANUFACTURE OF OBJECTS FROM WATER-HARDENED MATERIAL

Joseph J. P. Bömers, Weert, Netherlands; David G. Ellis, Leeds, England; Johann J. Jansen, Nieuwstadt, and Jan M. J. M. Bijen, Munstergeleen, both of Netherlands, assignors to Plasticisers, Ltd., Drighlington, England

Filed Dec. 18, 1980, Ser. No. 217,681
Claims priority, application Netherlands, Dec. 22, 1979, 7909298
Int. Cl.³ B32B 31/00
U.S. Cl. 156—164 12 Claims



1. In a process for the manufacture of objects from water-hardened materials, reinforced with at least one reticulate web which has been formed by stretching, fibrillating, and spreading an organic polymeric material, said process including the steps of continuously supplying said at least one reticulate web into contact with a water-hardenable material and water, and shaping and hardening the resulting composite material to form said object, the improvement comprising:

continuously supplying said at least one reticulate web to a moving carrier from a direction virtually normal to the direction of travel of said carrier;

folding said at least one reticulate web in a zig-zag manner to form a folded network on said carrier;

adjusting the rate of supply of said at least one reticulate web to be folded and the rate of travel of said carrier such that the angle between two successive folded sides of said at least one reticulate web so folded is between ¼° and 120°; and

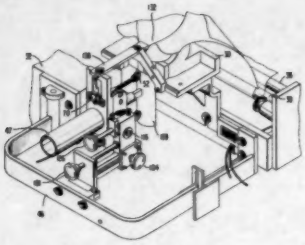
subsequently contacting said folded network with a water-hardening material and water.

4,373,982

ULTRASONIC SEALING APPARATUS

William D. Kreager, Dallas, Tex., and Stanley I. Mason, Jr., Weston, Conn., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 209,979
Int. Cl.³ B29C *27/08*; B29D *23/10*
U.S. Cl. 156—359 10 Claims



6. In an apparatus for forming, sealing and filling bags made of sealable sheet material,

(a) a bag-forming unit;

(b) means for supplying sheet material to said forming unit;

(c) said forming unit being suitable for shaping said sheet material into tubular form with contiguous edges;

(d) an anvil over which said edges can be moved;

(e) an ultrasonic unit including a horn positioned in closely spaced relationship to said anvil;

(f) means for moving said sheet material with the edges thereof disposed between said anvil and said horn;

(g) means responsive to movement of said sheet material for controlling the energization of said ultrasonic unit;

(h) said means for supplying sheet material including a roller over which said sheet material can be passed;

(i) said responsive means including a tachometer having a wheel engaging said roller; and

(j) said tachometer being suitable for developing a signal to control energization of said ultrasonic unit.

8. In an apparatus for forming, sealing and filling bags made of sealable sheet material,

(a) a bag-forming unit;

(b) means for supplying sheet material to said forming unit;

(c) said forming unit being suitable for shaping said sheet material into tubular form with contiguous edges;

(d) an anvil over which said edges can be moved;

(e) an ultrasonic unit including a horn positioned in closely spaced relationship to said anvil;

(f) means for moving said sheet material with the edges thereof disposed between said anvil and said horn;

(g) means responsive to movement of said sheet material for controlling the energization of said ultrasonic unit;

(h) adjustable means engaging said forming unit and engaging supporting structure for said ultrasonic unit to position said ultrasonic unit relative to said forming unit in rigid relationship;

(i) said adjustable means including a rigid bar member connected to said forming unit at one end and to said ultrasonic unit supporting structure at the other end;

(j) said ultrasonic unit supporting structure including a bracket member;

(k) at least one of said members including an elongated slot; and

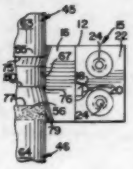
(l) a bolt received in said slot for adjustably connecting said bar to said bracket.

4,373,983

MEANS FOR ASSEMBLING CONTAINER HALVES

John Walter, Evergreen Park, Ill., assignor to Continental Group, Inc., Conn.

Continuation-in-part of Ser. No. 40,354, May 18, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,454
Int. Cl.³ B29D *3/00*
U.S. Cl. 156—423 10 Claims



10. A system for joining two container sections of equal external diameters, wherein one section is insertable into the other and each section being made of metal such as aluminum alloy and each section having a body side wall of less than 9 mils in thickness, an end wall connected to one end of the side wall and the body having a flexible open end portion at the other end terminating in a raw edge highly susceptible to distortion and crimping,

means for applying a stabilizing flexible coating of adhesive on the open end portion of at least one of said sections,

means for axially aligning said sections with their open ends portions toward each other,

means for shaping one of said sections into a cylindrical shape at said open end portion,

means for imposing a hoop stress on the open end portion of the other section to an extent sufficient to reduce the diameter of the other section less than the internal diameter of said one section means for urging said sections towards each other and effecting insertion of said end portion of the other section into said one section end portion while thus maintaining said other section reduced in diameter,

means for releasing said shaping and hoop stress imposing means and thereby permitting said end portion of said other section to expand within said end portion of said one section,

and means for heating said adhesive to effect a bond between said portions.

4,373,984

MACHINE FOR APPLYING TRANSFER FOIL TO A SHAPED EDGE OF A SUBSTRATE

James H. Hawkins, Anderson, Calif., assignor to Voorwood Company, Anderson, Calif.

Filed Jul. 16, 1980, Ser. No. 169,375
Int. Cl.³ B32B *31/00*; B65C *1/00*; B32B *3/04*
U.S. Cl. 156—477.1 7 Claims

1. A machine for applying transfer foil to a shaped edge of a substrate, said machine comprising:

a. an elongated frame having opposite lateral sides and extending from a forward end to an after end;

b. transport means adjacent said frame for advancing the substrate from said forward end toward said after end with the shaped edge facing toward one of said lateral sides of said frame;

c. means on said frame for supplying transfer foil to the shaped edge in synchronism with the speed of advance of the substrate;

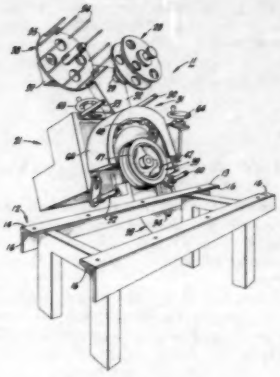
d. an applicator wheel rotatably mounted on said one lateral side of said frame, said wheel having a periphery of resilient material profiled to conform to the shaped edge;

e. means for radiantly heating the periphery of said wheel to

a temperature sufficient to effect transfer of the foil coating to the shaped edge;

f. means for biasing said wheel against the shaped edge with sufficient force to flatten the resilient material of said wheel so that the heated material remains in heat transferring contact with the transfer foil for a dwell period substantially in excess of the substantially instantaneous contact which obtains in a line engagement;

g. means for guiding the transfer foil between the shaped edge and the adjacent periphery of said wheel at a constant attack angle on the order of five degrees or less thereby helping to preclude the formation of wrinkles and



other anomalies in the foil coating transferred to the shaped edge;

h. an arcuately slotted C-shaped sector plate mounted transversely on said one lateral side of said frame, a shaft, means for positioning said shaft at predetermined angular attitudes on said sector plate, means for mounting said applicator wheel on one end of said shaft, and an electrical motor in driving engagement with the other end of said shaft; and,

i. a one-way dog clutch interposed in said shaft between said applicator wheel and said motor, said clutch being effective to drive said applicator wheel from said motor when said applicator wheel and the transfer foil are disengaged.

4,373,985

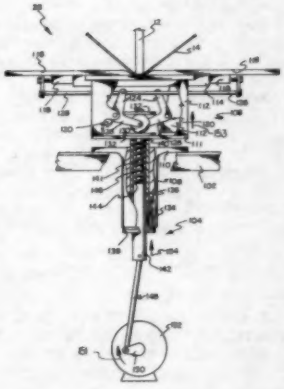
ADHESIVE BINDER

Major D. Glendening, St. Joseph, Mich., assignor to F. P. Rosback Company, St. Joseph, Mich.

Filed Apr. 1, 1981, Ser. No. 250,046
Int. Cl.³ B42C *19/00*
U.S. Cl. 118—103 **8 Claims**

1. In an adhesive binding machine for collated paper, said machine including a glue pot having side walls and a bottom wall across which said paper traverses, roller means within said pot for applying glue from a glue supply contained in said pot to a trimmed edge of said pages, the improvement in said glue pot comprising a second roller means parallel to and rotatable in the same direction as said first mentioned roller means for applying glue from said glue supply to said trimmed paper edge, means for rotating said first mentioned and second roller means in the direction of travel of said paper across said glue pot, string means stretched across said glue pot downstream relative to the direction of travel of said paper from said second roller means for wiping excess glue from said trimmed paper edges.

8. In an adhesive binding machine for collated paper, said machine including a frame carrying a device for applying a cover sheet to said paper about one trimmed edge having glue applied thereon, said cover applicating device including nipper means having slidable opposed table portions for supporting said cover and pressing the cover about said trimmed edge, said table portions having corresponding lower and upper positions and first and second spaced positions wherein the table portions are more closely positioned to each other when in said second position, the improvement comprising actuator means including a cyclical motor means for actuating the actuator, said actuator means for shifting said table portions from said lower position into said upper position when supporting said cover to urge the cover into contact with said trimmed edge and shifting said table portions from said first position into said second position during one cycle of said motor means, said nipper means including camming means connected between said actuator means and said table portions for shifting said table portions from said first position to said second position, said camming means including a pair of bellcranks, one arm of each bellcrank connected to a table portion and the other arm of each bellcrank eccentrically connected to a roller cam wherein upper movement of the roller cam causes the connected table portion to shift into said second position, upper and lower rigidly spaced cam retainer plates, each roller



cam being located between and horizontally shiftable between said retainer plates, said actuator means including a housing connected at its upper end to said machine frame and having a bore therethrough, a hollow cylindrical shaft fitting slidably within said housing bore and having an upper end and a lower end, a vertically shiftable support carrying said table portions and camming means, said hollow shaft upper end being connected to said support, said hollow shaft lower end carrying a stop engageable with the lower end of said housing, a second shaft fitting slidably within said hollow shaft and pivotally connected at its lower end to a motor means eccentric crank, said second shaft having an upper end attached to said lower cam retainer plate, biasing means between said second shaft and hollow shaft for causing the joint upper movement of the second shaft and hollow shaft relative to said housing to cause said support to shift upwardly and said table portions to shift into said upper position, said biasing means yielding to permit upper movement of the second shaft relative to the hollow shaft when said stop contacts the lower end of said housing to cause said cam retainer plates to shift upwardly and said table portions to shift into said second position.

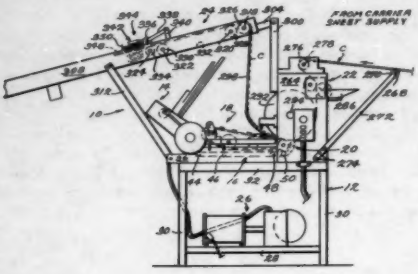
4,373,986
GLUING MACHINE

Clendon W. Cone, Glens Falls, N.Y., assignor to Web Graphics, Inc., Glens Falls, N.Y.

Division of Ser. No. 19,332, Mar. 12, 1979, Pat. No. 4,270,967. This application Apr. 13, 1981, Ser. No. 253,460

Int. Cl.³ B65H *39/02*; B31B *1/08*

U.S. Cl. 156—552 **17 Claims**



1. A gluing machine for gluing documents onto a continuous carrier sheet so that leading documents overlap trailing documents comprising document feed means for individually, successively feeding documents from a stack toward a first path in unlapped relation, first feed means for receiving said unlapped documents and for overlapping said documents so that the trailing portion of leading documents is held spaced above the leading portion of trailing documents while feeding said documents along said first path, second feed means for feeding a continuous carrier sheet along a second path which intercepts the first path at a predetermined point, gluing means for applying glue at predetermined, spaced apart intervals to said carrier sheet, and attachment means for bringing the leading edge of the documents into contact with the glue applied to said carrier sheet.

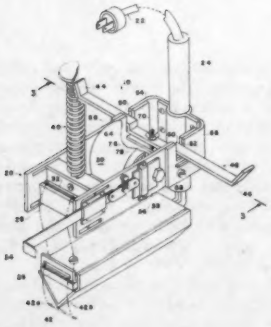
4,373,987
ANGLE-ATTACHMENT STABILIZING UNIT

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Filed Oct. 1, 1981, Ser. No. 307,365

Int. Cl.³ B44C *7/02*; D06F *75/32*

U.S. Cl. 156—574 **2 Claims**



1. In a system for stabilizing a "V"-section soleplate attachment of a manually advanced tape-applying unit as said tape applying unit is in operation applying tape and with said "V"-section soleplate attachment heat sealing tape along a joint in an interior corner formed by first and second wall panels, the "V"-section soleplate attachment including first and second planar portions for conforming respectively to the first and second wall panels on either side of the vertex of said "V"-section, the improvement comprising: means on said tape applying unit for guiding on said first and second wall panels, means for adjustably aligning said guiding means on said first and second wall panels in predetermined relation to the "V"-section soleplate attachment; the predetermined relation being with the means for guiding in-plane with the respective first and second planar portions and spaced therefrom in a direction away from said joint; the means for guiding including a member generally transverse to the direction of said advance and having thereon first and second ends for contacting respective wall panels, the first and second ends spaced apart a distance greater than the greatest distance across said "V"-section; said first and second ends being planar ends and forming a right angle between them, said first and second ends diverging from each other, and the means for adjustably aligning including means on said member for resiliently equalizing pressure on said guiding means during said operation.

4,373,988
METHOD OF GROWING EPITAXIAL LAYERS FROM A LIQUID PHASE

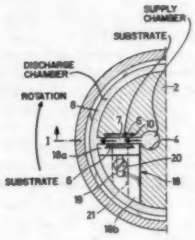
Elisabeth Bauser, Ludwigsburg; Martina Frik, Nuertingen; Karl S. Löchner, Gerlingen, and Laurenz Schmidt, Stuttgart, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 613,929, Sep. 16, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,944

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1974, 2445146

Int. Cl.³ C30B *19/00*

U.S. Cl. 156—622 **7 Claims**



1. Method of economically producing, with high regularity, a layer on at least one substrate by epitaxial growth, comprising the steps of:

dispersing a layer-forming material in a liquid and providing a predetermined quantity of said liquid containing the layer-forming material in a supply chamber;

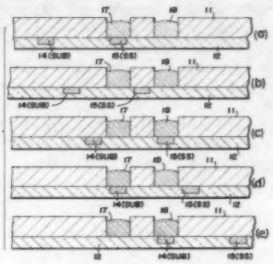
forcing the liquid containing the layer-forming material, under the influence of forces of externally applied to said liquid, from said supply chamber into at least one gap-like channel on a wall of which said substrate is firmly held; and

causing epitaxial crystal growth to take place on said substrate only while said predetermined quantity of liquid containing the layer-forming material flows continuously and uniformly along said substrate until said supply chamber is empty, said liquid being caused to flow under the influence of said externally applied forces from said supply chamber outward as a substantially unidirectional stream, under pressure from opposition to said forces produced by confinement of said liquid by the gaplike configuration of said channel along and past the surface of said substrate at a rate controllable by said applied forces while under more than atmospheric pressure, and out of said channel to a drain chamber.

4,373,989
CONTROLLED IN SITU ETCH-BACK

James M. Beggs, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Robert J. Mattauch, Charlottesville, Va., and Alan C. Seabaugh, Olney, Md.

Filed Nov. 30, 1981, Ser. No. 325,933
Int. Cl.³ H01L 21/306
U.S. Cl. 156—635 19 Claims



1. A method of etching back the top surface of a substrate with an etch melt, the substrate being one on which a layer of matter is to be grown epitaxially from a growth melt, the steps comprising:

saturating the etch melt at a temperature, definable as T_{es};

saturating the growth melt at a temperature, definable as T_{gs} which is greater than T_{es};

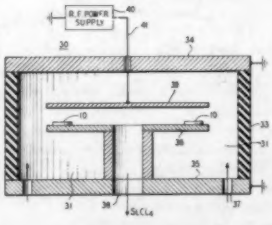
exposing the substrate to the etch melt at a temperature definable as T_e, where $T_{gs} > T_e > T_{es}$ for a selected period, T_e being a temperature at which the depth of etching vs. time of the substrate by the etch melt, saturated at T_{es} is known; and

after said selected period exposing said substrate to said growth melt, to grow a layer thereon.

4,373,990
DRY ETCHING ALUMINUM

Roy A. Porter, Whitehall, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 8, 1981, Ser. No. 223,333
Int. Cl.³ C23F 1/02; H01L 21/306; C03C 15/00, 25/06
U.S. Cl. 156—643 1 Claim

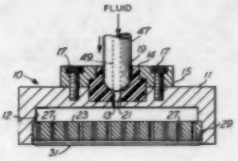


1. A process for etching a desired pattern in a dual layer of aluminum and doped polycrystalline silicon overlying a semiconductive wafer comprising forming over the dual layer an etch-resistant mask apertured in accordance with the desired pattern and exposing the masked wafer to an ambient consisting essentially of substantially pure silicon tetrachloride vapor which has been ionized for a time and at a gas pressure and power density that the desired pattern is etched anisotropically in the dual layer in a single operation.

4,373,991
METHODS AND APPARATUS FOR POLISHING A SEMICONDUCTOR WAFER

Edward L. Banks, Willingboro Township, Burlington County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,604
Int. Cl.³ B24B 5/00, 1/00; H01L 21/306
U.S. Cl. 156—645 5 Claims



1. A method of polishing a wafer, comprising the steps of:

capturing the wafer between a holding means and a rotating polishing pad; and

continuously injecting a liquid under pressure, between the wafer and the holding means to permit free floating rotative motion of the wafer during polishing.

4,373,992
NON-ASBESTOS FLOORING FELT CONTAINING PARTICULATE INORGANIC FILLER, A MIXTURE OF FIBERS AND A BINDER

Alfredo A. Bondoc, Middlesex, N.J., assignor to Tarkett AB, Roaneby, Sweden

Filed Mar. 31, 1981, Ser. No. 249,322
Int. Cl.³ D04H 1/64; D21F 11/00; D21H 5/12, 5/18
U.S. Cl. 162—145 15 Claims

1. Sheet type felt comprising on a dry basis;

(a) between about 1 and about 10 wt. % glass fibers;

(b) between about 3 and about 25 wt.% cellulosic fibers;

(c) between about 3 and about 20 wt.% synthetic organic fibers;

(d) between about 3 and about 70 wt.% particulate inorganic filler;

(e) between about 10 and about 30 wt.% latex binder;

(f) between about 3 and about 80 wt.% calcium hydroxide; and

(g) between about 0.1 and about 10 pounds polymeric flocculating agent per ton of felt.

4,373,993
SLICE LIP FORMING A SMOOTH CONTINUOUS SURFACE

Haruyoshi Fujiwara, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 25, 1981, Ser. No. 237,908
Claims priority, application Japan, Mar. 7, 1980, 55-28722; Jun. 20, 1980, 55-83664
Int. Cl.³ D21F 1/02, 1/04
U.S. Cl. 162—347 1 Claim

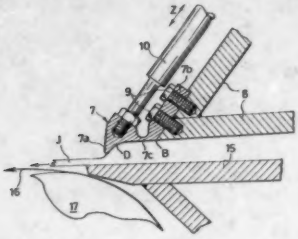
1. A device for forming a sheet-like jet of fluid comprising:

a main body having a surface adapted to be in contact with said fluid;

a mating lip having a surface defining with said main body surface a flow passage for the fluid to flow in a flow direction;

a slice lip having a connecting portion fixed to said main body with a surface, adjacent said main body surface, to be in contact with the fluid and extending coplanar with said main body surface, said slice lip having a tip portion with a surface adapted to be in contact with the fluid and a neck portion connected between said connecting and tip

portions which is flexible with respect to said connecting and tip portions and flexible in a direction orthogonal to the fluid flow direction, said neck portion having a surface adapted to be in contact with the fluid, said tip portion surface and said mating lip surface defining a gap therebetween for forming the sheet-like jet of fluid; and



at least one adjusting rod connected to said tip portion which is movable to flex said neck portion and move said tip portion to change a width of said gap;

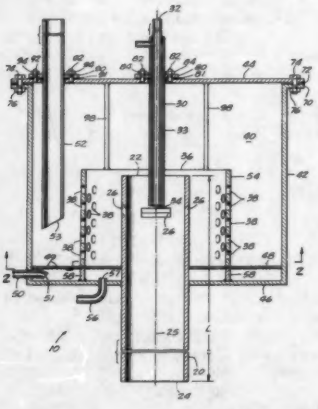
said surface of said connecting portion, said neck portion and said tip portion forming a smooth continuous surface which converges toward said mating lip surface in the fluid flow direction, in a streamline fashion toward said gap.

4,373,994

PYROLYSIS PROCESS AND APPARATUS

Chang-Kuei Lee, Sewell, N.J., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Sep. 28, 1981, Ser. No. 306,551
Int. Cl.³ C10B *1/04, 3/00, 49/20, 49/22*
U.S. Cl. 201—22 **13 Claims**



1. A method for controlling the flow of solid heating media into a pyrolysis reactor comprising:

a. introducing a heated particulate solid heating media into an outer section of a fluidization zone which comprises said outer section and an inner section, said outer section being separated from said inner section by a vertically oriented redistributor means having a plurality of openings communicating said outer section with said inner section;

b. fluidizing said heating media in said outer section with a fluidizing gas and causing said heating media to flow through said openings into said inner section, said inner section being formed by said redistributor means and a vertically oriented conduit reactor, said reactor having an inlet, the plane of said reactor inlet being perpendicular to the axis of said reactor, said reactor having a plurality of secondary inlet slots below the plane of said reactor inlet communicating said inner section with the inside of said reactor; and

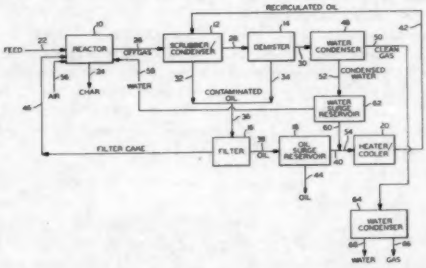
c. fluidizing said heating media in said inner section with a fluidizing gas and causing a first part of said heating media to flow over said reactor inlet and then downwardly in column flow along the inside surface of said reactor, and simultaneously causing a second part of said heating media to flow through said secondary inlet slots into said reactor thereby augmenting the downwardly column flow of said first part of said heating media along said reactor inside surface in such a way that a continuous and substantially circumferentially uniform downwardly flowing column of said heating media is formed below said secondary inlet slots.

4,373,995

PYROLYSIS SYSTEM UTILIZING PYROLYTIC OIL RECYCLE

Mack D. Bowen, 910 Reed Rd., SE., Smyrna, Ga. 30080, and Kenneth R. Purdy, 1485 Leafmore Ridge, Decatur, Ga. 30033

Division of Ser. No. 212,041, Dec. 3, 1980, Pat. No. 4,317,703.
This application Oct. 5, 1981, Ser. No. 308,818
Int. Cl.³ C10B *15/00, 39/06, 49/06, 53/02*
U.S. Cl. 202—95 **12 Claims**



1. A system for carrying out the continuous pyrolysis of a feed of cellulosic material capable of pyrolyzing to a solid residue and a gaseous mixture, the solid residue comprising a significant amount of fine particulates and the gaseous mixture comprising fractions that are noncondensible and condensible, the latter including a substantial amount of water vapor, the combination including:

(a) a reactor for continuously effecting the pyrolysis of such feed, as a descending packed bed, said reactor having inlets for feed, filter cake, reaction air and quenching water, and having outlets for offgases and the solid residue product;

(b) oil scrubber/condenser means connected to said offgas outlet of said reactor;

(c) water condenser means in the offgas stream from said scrubber/condenser means;

(d) means for recycling condensate from said water condenser means to said quench water inlet of said reactor;

(e) filter means in the liquid stream from said scrubber/condenser means;

(f) means for recycling filter cake from said filter means to said filter cake inlet of said reactor;

(g) means for recycling pyrolytic oil from said filter means to said oil scrubber/condenser means for use as the scrubbing medium; and

(h) means for controlling the rates of recycle of the condensed water, filter cake and pyrolytic oil, whereby the

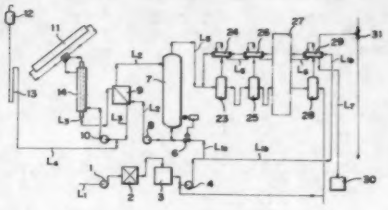
system can be used to produce an enriched gaseous product and pyrolytic oil from such a cellulosic material.

4,373,996

APPARATUS FOR PRODUCING FRESH WATER FROM SEA WATER

Saburo Maruko, 430-3 Kamiwada, Yamato-Shi, Kanagawa-Ken, Japan

Filed Mar. 4, 1981, Ser. No. 240,597
Claims priority, application Japan, Mar. 4, 1980, 55-26104
Int. Cl.³ C02F 1/06, 1/14
U.S. Cl. 202—173 **3 Claims**



1. An apparatus for producing fresh water from sea water comprising:

a solar heat collector having an inlet and an outlet,

closed loop conduit means interconnecting said inlet and outlet of said collector for passing therethrough a high temperature liquid,

a first pump in said closed loop conduit means,

a heat exchanger having first and second inlets and first and second outlets, said first inlet and first outlet being connected to said closed loop conduit means for passing said high temperature liquid through one side of said exchanger,

a vertical accumulator having a bottom, a lower portion, an upper portion, and a top,

a first sea water feed line connected to said bottom of said accumulator,

a pressure regulator in said first sea water feed line upstream of said bottom for regulating the pressure in said accumulator to a predetermined pressure above atmospheric pressure,

a second sea water line connected from said first sea water feed line adjacent said bottom to said second inlet of said exchanger,

a second pump in said second sea water line,

means for shutting down said second pump when the sun is not shining,

a third sea water line from said second outlet of said exchanger to said upper portion of said accumulator,

an evaporator, and

a fourth sea water line from said top of said accumulator to said evaporator,

said upper portion of said accumulator receiving higher temperature sea water from said exchanger when said second pump is operating, said lower portion holding lower temperature sea water,

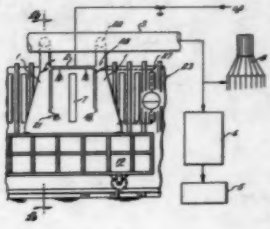
whereby when the sun is shining, a proportion of higher temperature sea water in said accumulator increases displacing the lower temperature sea water therein out of said bottom and when the sun is not shining, higher temperature sea water is fed from the upper portion of the accumulator to said evaporator by being pushed out by said lower temperature sea water coming in said bottom so that said evaporator is constantly supplied with higher temperature sea water regardless of whether the sun is shining or not.

4,373,997

APPARATUS FOR THE TRANSFER AND QUENCHING OF COKE

Claus Flockenhaus; Manfred Galow, both of Essen; Joachim F. Meckel, Heiligenhaus, and Horst G. Joseph, Essen, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Fed. Rep. of Germany

Division of Ser. No. 108,008, Dec. 28, 1979, Pat. No. 4,282,068. This application Jan. 23, 1981, Ser. No. 227,749
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900079
Int. Cl.³ C10B 39/04
U.S. Cl. 202—230 **4 Claims**



1. In a coke quenching system, the combination comprising a coke quenching car for receiving hot coke from a coke oven and transferring it from the coke oven, a hood located in close proximity above the quenching car, and means for moving the hood independently of but with the quenching car, the hood including in the interior thereof a central chamber closed at its top, nozzle means associated with said central chamber for spraying the coke in the quenching car immediately below said central chamber with water to quench the coke, a pair of lateral baffles extending vertically downwardly from the top of the hood and defining with the end walls of the hood a pair of lateral chambers, said lateral chambers being separated from said central chamber by said lateral baffles at their upper portions but being in fluid communication therewith at their lower portions such that the quenching offgases rise in said central chamber and are then forced to flow around the lower ends of the lateral baffles and into said lateral chambers, vertical exhaust shafts connected to the tops of the lateral chambers for creating an updraft in said lateral chambers, and nozzles means inside said lateral chambers for condensing the upwardly flowing offgases resulting from the quenching of the coke in the quenching car.

4,373,998

ASCENSION PIPE HEAT SHIELD

Earl C. Hetrick, Natrona Heights, and Donald T. Winter, Pittsburgh, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 26, 1981, Ser. No. 315,066
Int. Cl.³ C10B 27/06, 41/08
U.S. Cl. 202—258 **21 Claims**

1. In combination, a heated vertical pipe and a device for providing enhanced heat shielding on an inward side of the heated vertical pipe which projects from a pipe supporting structure comprising:

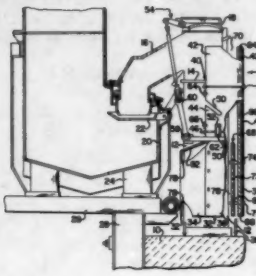
(a) a generally cylindrical lower wall section spaced from and peripherally enclosing the pipe in generally concentric arrangement so as to form a peripheral lower vertical air space between itself and the pipe;

(b) means for remotely mounting said lower wall section above the pipe supporting structure as to establish lower fluid communication between said lower vertical air space and ambient air;

(c) an arcuate upper wall section aligned with and connected end to end to the cylindrical lower wall section and in-

wardly displaced from the pipe so as to form an upper vertical air space vertically contiguous with said lower vertical air space;

(d) a lower interior vertical wall section inwardly displaced from the pipe below said arcuate upper wall section so as to partition said peripheral lower vertical air space into a



warmer air flow channel peripherally adjacent to the pipe and a cooler air flow channel remote from the pipe; and

(e) closure means for outwardly blocking the warmer air flow channel, such that ambient air is drawn upwardly first through said lower vertical air space then through said upper vertical air space and is then upwardly discharged so as to continuously dissipate pipe heat.

4,373,999

DISTILLATION OF BUTINEDIOL-1,4

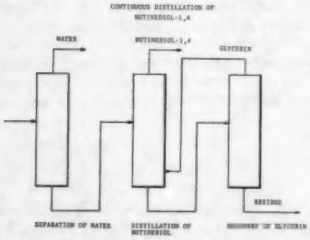
Helmut Westernacher, Haltern, and Karl Aertken, Dülmen, both of Fed. Rep. of Germany, assignors to GAF-Hüls Chemie GmbH, Marl, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,550

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114153

Int. Cl.³ B01D *3/34;* **C07C** *33/046*

U.S. Cl. 203—6 **5 Claims**



1. In the process for purifying butinediol-1,4 by distillation, the improvement comprising:

adding glycerin to the butinediol-1,4 to be distilled.

4,374,000

METHOD FOR CONTROLLING THE FORMATION OF POLYMER ACCUMULATIONS DURING DISTILLATION OF A VINYLAROMATIC MONOMER

Marshall W. Abernathy, Big Spring, Tex., and Darrell E. Bailey, Prairieville, La., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Feb. 2, 1981, Ser. No. 230,617

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—9 **22 Claims**

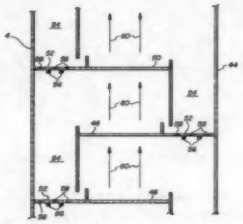
1. A method for controlling the formation of polymer accumulations on the underside of a seal pan underneath a downcomer in a downcomer-equipped distillation column used for distillative purification of a vinylaromatic monomer, said method comprising:

accumulating liquid phase material containing an effective polymerization inhibiting concentration of polymerization inhibitor in the seal pan; and

providing liquid pervious weep hole means through said seal pan spaced and dimensioned to provide a controlled quantity of polymerization inhibitor-containing liquid phase material from the seal pan through said weep hole means to the underside of the seal pan.

21. A method for the distillative purification of a vinylaromatic monomer comprising the steps of:

(a) distilling said crude vinylaromatic monomer to separate a recycle overhead fraction comprising lower boiling materials from a recycle bottoms fraction comprising vinylaromatic monomer and higher boiling materials,



(b) distilling said recycle bottoms fraction to separate a finish overhead fraction comprising substantially pure vinylaromatic monomer from a finish bottoms fraction comprising higher boiling materials, and

(c) providing liquid pervious weep hole means through the seal pans of a distillation column used for at least one of said distilling steps spaced and dimensioned to provide a controlled quantity of inhibitor-containing liquid phase material through said weep hole means,

wherein the formation of polymer accumulations on the underside of seal pans underneath the downcomers in downcomer-equipped distillation columns used for said distillative purification is controlled by accumulating liquid phase material containing an effective polymerization inhibiting concentration of polymerization inhibitor in said seal pans and allowing a controlled quantity of polymerization inhibitor-containihg liquid phase material from said seal pans to seep through said weep hole means to the underside of said seal pans.

4,374,001

ELECTROLYTIC PRINTING

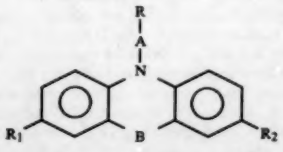
William E. Bernier, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,832

Int. Cl.³ G01D *15/06, 15/34*

U.S. Cl. 204—2 **24 Claims**

1. An electrochromic printing media which comprises a substrate coated on at least one surface thereof with about 2 to about 100 milligrams for each 8½" by 11" area of said substrate of a leuco dye color forming material of the formula:



wherein A is C=O or SO_2; B is S or O; each R_1 and R_2 individually is a group capable of donating an electron; and R is an organic radical such that in the presence of bromine and upon being subjected to a voltage, the leuco dye converts to a colored dye upon splitting of the A—R group; and coated with at least about 10 milligrams for each 8½" by 11" area of said substrate of said leuco dye; and wherein the weight ratio of bromide to leuco dye is about 1 to 1 to about 30 to 1.

4,374,002

METHOD FOR PRODUCING HIGHLY REFLECTIVE METAL SURFACES

Jones B. Arnold, Knoxville; Philip J. Steger, and Ralph R. Wright, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 4, 1982, Ser. No. 354,571
Int. Cl.³ C25D *1/06*
U.S. Cl. 204—7 **10 Claims**

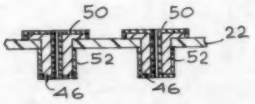
8. A method of producing mirror surfaces, comprising:
(a) electrolessly depositing nickel on an article to form an amorphous nickel surface thereon,
(b) diamond-machining said surface to increase its smoothness and optical reflectivity,
(c) passivating the machined nickel surface to render it incapable of bonding to electroplated nickel,
(d) contacting the passivated nickel surface with a wetting agent,
(e) electrodepositing nickel on the passivated surface in an aqueous nickel sulfamate plating bath substantially free of chlorides to form thereon a layer of electroplated nickel whose inner surface is a replica of said passivated surface, and
(f) separating said electroplated layer intact from said passivated surface.

4,374,003

FINE LINE CIRCUITRY PROBES AND METHOD OF MANUFACTURE

William P. Dugan, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 125,814, Feb. 28, 1980. This application Jul. 2, 1981, Ser. No. 279,890
Int. Cl.³ C25D *1/08, 5/02, 5/54*
U.S. Cl. 204—11 **16 Claims**



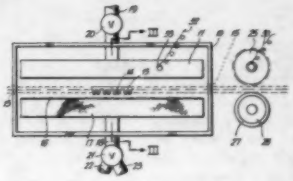
1. A method for the production of a circuit board comprising:
providing apertures in a selected plural layer base;
coating the base and the apertures with a conductive material;
electroplating the coated board to produce probe precursors in the apertures;
removing the electroplate from the outer surfaces of said base;
masking the surface of said base in a selected pattern;
etching the unmasked surface on at least one side of the masked board;
removing at least one selected layer of the plural layer forming the base to expose the probes.

4,374,004

METHOD AND APPARATUS FOR SURFACE-TREATING PREDETERMINED AREAS OF A SURFACE OF A BODY

Amir Salama, Cartierville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 29, 1981, Ser. No. 278,744
Int. Cl.³ C25D *5/02*
U.S. Cl. 204—15 **12 Claims**



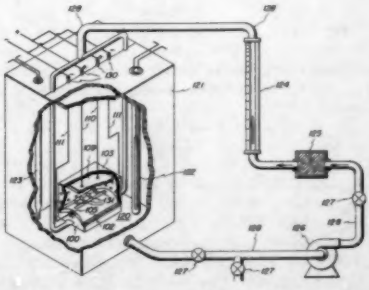
1. Apparatus for electroplating one surface of each of a plurality of spaced apart rectangular cross-section terminal pins, having front, back and side surfaces, comprising:
a tank;
means for supporting said pins in a predetermined position in said tank;
means for ejecting a plating solution towards the front surface of each pin;
an anode in the flow path of the plating solution, and means for supplying electrical power to said anode and to said pins;
an inflatable member in said tank positioned adjacent to the rear surfaces of the pins, said inflatable member having a thin flexible, extensible, front surface of elastomeric material for contacting the back and side surfaces of the pins;
means for feeding an inflation gas to said inflatable member;
said flexible front surface extended on inflation of said inflatable member to wrap around said pins in contact with the back and side surfaces of the pins, to expose only the front surfaces of the pins to the plating solution.

4,374,005

METHOD FOR FABRICATING A TRANSVERSE MAGNETIC PRINTING HEAD

Bernard D. Nathan, Liverpool, and Donald R. Witter, Skaneateles, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 40,586, May 21, 1979, Pat. No. 4,291,314. This application Jul. 1, 1981, Ser. No. 279,372
Int. Cl.³ C25D *5/02, 5/48*
U.S. Cl. 204—15 **45 Claims**



1. A method of manufacturing a magnetic printing head for

recording latent magnetic images on a magnetizable recording medium moving relative to said head, comprising the steps of:

placing a plurality of nonintersecting, conductive lines on an insulating substrate such that said lines cross an elongated gap in said substrate, said lines being insulated along those line portions crossing said gap; and

electrodepositing a magnetically permeable material between said conductive lines in the region where said lines cross said gap.

4,374,006

ELECTROLYTIC BATH FOR THE DEPOSITION OF HIGH GLOSS WHITE GOLD COATINGS

Eberhard Bitzer, Ebingen; Wilhelm Aichinger, Schwäbisch Gmünd, and Gerhard Steinhilber, Aalen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,985

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013030

Int. Cl.³ C25D *3/62*

U.S. Cl. 204—43 G 6 Claims

1. An electrolytic bath for the deposition of high gloss white gold coating comprising 2–10 g/l of gold in the form of a sulfite complex, 2–40 g/l of alkali sulfite, 2–40 g/l of a complexing agent, 1–10 g/l of nickel and 1–20 g/l of cadmium in each case in the form of a water soluble slat and 0.5–10 g/l of orotic acid, a derivative of orotic acid or a salt of orotic acid.

4,374,007

TRIVALENT CHROMIUM ELECTROPLATING SOLUTION AND PROCESS

Donald J. Barclay, and James M. L. Vigar, both of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1981, Ser. No. 239,919

Claims priority, application United Kingdom, Mar. 10, 1980, 8008034; European Pat. Off., Feb. 16, 1981, 81101075.0

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 13 Claims

1. An aqueous chromium electroplating solution comprising chromium (III) and thiocyanate ions and a supporting electrolyte which is chloride free, and a mixture of sodium and potassium sulphate in a concentration sufficient to provide electrical conductivity for the plating process, the concentration of sodium sulphate being in the range of about 0.1 to 1 Molar, and the concentration of potassium sulphate being about 1 Molar.

4,374,008

PROCESS FOR SEPARATING TUNGSTEN FROM COINAGE METALS

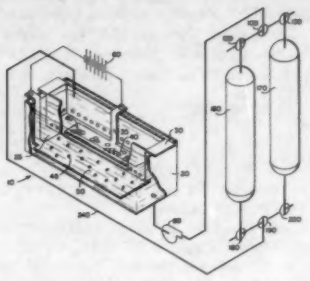
Samuel Natansohn, Sharon, and Gary Czupryna, Salem, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 1, 1981, Ser. No. 269,192

Int. Cl.³ C25C *1/08, 1/22*

U.S. Cl. 204—109 11 Claims

1. A process for separately recovering tungsten and a coinage metal from alloys or mixtures thereof comprising electrowinning said coinage metal from aqueous nitrate electrolyte solution contained in an electrowinning cell having an anode, comprising said alloy or mixture of tungsten and a coinage metal, and a cathode; wherein said electrolyte solution is maintained substantially free of dissolved tungsten by contacting, in a chamber separate from said electrowinning cell, said electrolyte solution with an anion exchange resin to selectively remove tungsten therefrom to deposit said coinage metal at said cathode in a form substantially free of tungsten contamination



and separately recovering said selectively removed portion of tungsten from said anion exchange resin.

4,374,009

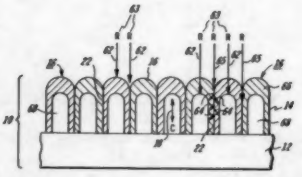
ELECTROCHEMICAL POST TREATMENT OF PERPENDICULAR MAGNETIC RECORDING MEDIA

Tu Chen, Saratoga, Calif., and Pietro L. Cavallotti, Milan, Italy, assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1981, Ser. No. 306,126

Int. Cl.³ C25F *3/00*

U.S. Cl. 204—129.1 4 Claims



1. A method of post treatment to a continuous thin film magnetic medium comprising a substrate upon which is deposited a thin magnetic layer comprising acicular shaped crystalline magnetic particles with the crystallographic "c" axis of the crystal in each particle oriented parallel to the longitudinal axis of the particle acicula and the longitudinal axis of the acicular particles oriented substantially normal to the plane of said magnetic layer, said post treatment effectively increasing the separation between magnetic particles and thereby increasing their coercivity while decreasing their demagnetization field of the film, said method comprising the step of utilizing enhanced grain boundary reaction at the interganular boundary of said particles to achieve particle separation effectively either by electrochemical charging by cathodic action with a solution containing a reagent and immersing the magnetic layer into said solution thereby causing diffusion of the reagent into the outer portions of said acicular particles comprising the magnetic layer or by electrochemical etching by anodic action with a solution containing an agent and immersing the magnetic layer into said solution thereby causing removal of an outer portion of said acicular particles comprising the magnetic layer.

4,374,010

PHOTOCHEMICAL SEPARATION OF ISOTOPES

Andreas C. Vikis, Orleans, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jan. 30, 1979, Ser. No. 7,708
Int. Cl.³ B01D 59/00
U.S. Cl. 204—157.1 R 9 Claims

1. A process for the photochemical separation of at least one of the isotopes carbon-13 and oxygen-18 comprising:

(a) irradiating carbon monoxide with selected band-widths of 123.58 nm resonance radiation of krypton to selectively excite at least one of $^{13}C^{16}O$ and $^{12}C^{18}O$ species without significant excitation of $^{12}C^{16}O$, said band-width being selected from

(i) the slightly broadened and reversed krypton 80916.76±15 cm^{-1} radiation, which excites both $^{12}C^{18}O$ and $^{13}C^{16}O$, and

(ii) the moderately sharp krypton line 80916.76±3 cm^{-1} which excites only $^{13}C^{16}O$,

(b) permitting reaction of the excited carbon monoxide species with a second reactant to occur, the reaction product being enriched in at least one of carbon-13 and oxygen-18, and

(c) separating the isotopically-enriched products from the reaction.

4,374,011

PROCESS FOR FABRICATING NON-ENCROACHING PLANAR INSULATING REGIONS IN INTEGRATED CIRCUIT STRUCTURES

Madhukar B. Vora, Los Gatos, and Werner F. Rust, Mountain View, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed May 8, 1981, Ser. No. 261,843
Int. Cl.³ H01L 27/04
U.S. Cl. 204—192 EC 14 Claims

1. A method for fabricating an insulating region in conjunction with an integrated circuit structure having a substrate, the method comprising:

removing a first portion of the substrate to create an opening wherein the insulating region is to be formed;

beginning to deposit insulating material across the substrate and in the opening;

continuing to deposit insulating material while simultaneously removing insulating material from generally horizontal surfaces and redepositing it on generally vertical surfaces to create a substantially planar layer of insulating material across the substrate and over the opening; and

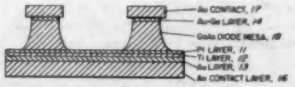
ceasing to deposit insulating material when the substantially planar layer is a desired thickness.

4,374,012

METHOD OF MAKING SEMICONDUCTOR DEVICE HAVING IMPROVED SCHOTTKY-BARRIER JUNCTION

Michael G. Adlerstein, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 75,353, Sep. 13, 1979, abandoned, which is a division of Ser. No. 833,317, Sep. 14, 1977, Pat. No. 4,197,551. This application Jun. 18, 1981, Ser. No. 275,081
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 SP 10 Claims



1. The method comprising the steps of:

providing a body of semiconductor material;

sputtering a Schottky-barrier forming metal upon at least a portion of a surface of said body of semiconductor material at a sputtering power level sufficient to cause alloying between a portion of said semiconductor material and at least a portion of the sputtered Schottky-barrier forming metal;

sputtering a layer of refractory metal over said sputtered Schottky-barrier forming metal; and

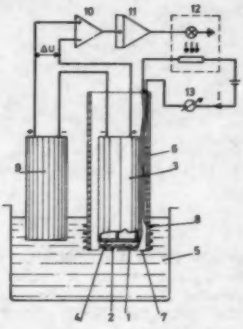
sputtering a layer of highly conductive metal over said layer of refractory metal.

4,374,013

OXYGEN STABILIZED ENZYME ELECTRODE

Sven-Olof Enfors, Markörvägen 2, S-191 41 Sollentuna, Sweden

Filed Mar. 3, 1981, Ser. No. 239,979
Claims priority, application Sweden, Mar. 6, 1980, 8001711
Int. Cl.³ C12Q 1/26
U.S. Cl. 204—195 B 10 Claims



1. Enzyme electrode for the analysis of a substrate in a sample comprising:

(a) an oxygen electrode on which or close to the sensitive surface of which at least one enzyme is immobilized, said oxygen electrode producing a signal responsive to the consumption of oxygen by the reaction between the enzyme and the substrate,

(b) means for producing a reference signal,

(c) means for electrolytically producing oxygen by the electrolysis of water, comprising an anode located close to the at least one enzyme, and a cathode,

(d) means for controlling the electrolysis current between the anode and cathode for producing oxygen in response to the difference between the signal from the oxygen electrode and the reference signal so that the limiting parameter for the enzyme reaction is the enzyme activity, and

(e) means for measuring the electrolysis current.

4,374,014

HIGH PRESSURE ELECTROLYTIC OXYGEN GENERATOR

Robert E. Smith, and Donald R. Gormley, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1981, Ser. No. 245,819
Int. Cl.³ C25B 9/04, 11/03, 13/06
U.S. Cl. 204—260 10 Claims

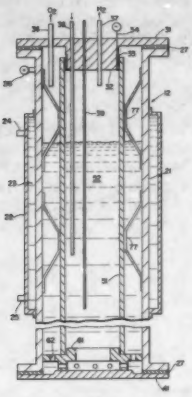
1. An electrolytic gas generator comprising:

a housing;

an electrode assembly supported within the housing, said electrode assembly including anode and cathode elements separated by an asbestos separator; and

means for transferring electrical currents between said housing and said electrode assembly, wherein said means for transferring electrical currents include a ring portion circumferentially engaging said electrode assembly, radi-

ally extending finger portions extending from said ring portion, and flange portions connected to said finger portions for contiguously engaging the inner surface of said housing.



4,374,015

PROCESS FOR THE LIQUEFACTION OF COAL

Michael R. Brule, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 9, 1981, Ser. No. 241,578
Int. Cl.³ C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **21 Claims**

1. In a coal liquefaction process wherein a liquefaction solvent that is at least partially distillable is used in a liquefaction zone to yield a product from which a slurry is recovered that comprises distillable and substantially nondistillable coal liquefaction products and an insoluble residue, the improvement which comprises:

contacting said slurry with a first extraction solvent comprising a polycyclic aromatic hydrocarbon containing at least one less substituted or unsubstituted carbon atom than said liquefaction solvent at a first elevated temperature level and pressure level such that the reduced temperature of said first extraction solvent is greater than about 0.7 and the reduced pressure of said first extraction solvent is greater than about 0.4 to effect a separation of said slurry into a substantially solids-free fraction comprising coal liquefaction products and first extraction solvent and a solids-containing fraction;

separating at least a portion of said first extraction solvent from said substantially solids-free fraction to provide a first extraction solvent-lean coal liquefaction product fraction;

contacting said first extraction solvent-lean coal liquefaction product fraction with a second extraction solvent having at least one less substituted or unsubstituted carbon atom than said first extraction solvent at a second elevated temperature level and pressure level such that the reduced temperature of said second extraction solvent is greater than about 0.7 and the reduced pressure of said second extraction solvent is greater than about 0.4 to effect a separation of said coal liquefaction products into a second light phase and a second heavy phase comprising substantially nondistillable coal-derived compounds at least a portion of which are capable of functioning as a coal solvent and some second extraction solvent;

recovering said substantially nondistillable coal-derived compounds; and

introducing at least a portion of said substantially nondistillable coal-derived compounds into said liquefaction zone to supplant a portion of said liquefaction solvent in said liquefaction process.

4,374,016

PROCESS FOR HYDROGENATING COAL AND COAL SOLVENTS

Arthur R. Tarrer, and Ketan G. Shridharani, both of Auburn, Ala., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 24, 1981, Ser. No. 295,896
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **6 Claims**

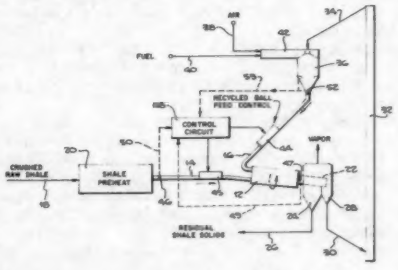
1. In a process for hydrogenating coal wherein a coal solvent is hydrogenated in the presence of a hydrogenation catalyst and that hydrogenated solvent in turn hydrogenates the coal, the improvement comprising carrying out the solvent hydrogenation in the presence of an iron sulfide catalyst of increased catalytic activity prepared by the reaction of ferric oxide with hydrogen sulfide within a temperature range of 260° to 315° C. in a non-oxidizing atmosphere.

4,374,017

HEAT FLUX CONTROL TECHNIQUE

John H. Barney, Golden, Colo., assignor to Tosco Corporation, Los Angeles, Calif.

Filed Oct. 24, 1980, Ser. No. 200,395
Int. Cl.³ C10G *1/02*
U.S. Cl. 208—11 R **9 Claims**



1. In an optimized method for retorting carbonaceous material, involving the addition of recycled heat-carrying bodies to carbonaceous material, and moving the carbonaceous material and recycled heat-carrying bodies in heat-transferring proximity with one-another to raise the temperature of the carbonaceous material to retorting heat levels, wherein the heat-carrying bodies have a critical weight ratio of recycled heat carrying bodies to carbonaceous material, below which chipping and cracking of such heat-carrying bodies may readily occur, the improvement comprising:

experimentally determining the critical weight ratio of recycled heat-carrying bodies to carbonaceous material, expressed as a continuously increasing function of temperature difference having a substantial positive slope with increasing temperature differences;

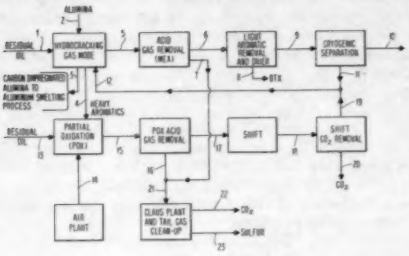
determining the difference in temperature between the recycled bodies and the carbonaceous material; and

providing a weight ratio which is greater than but substantially equal to said critical value for the temperature difference present in the process.

4,374,018
METHOD FOR PRODUCING UPGRADED PRODUCTS FROM A HEAVY OIL FEED

John C. C. Tao, Perkiomenville, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 20, 1981, Ser. No. 255,877
Int. Cl.³ C10G 47/04, 47/22
U.S. Cl. 208—112 8 Claims



1. A method for upgrading a heavy oil feed and producing a product synthetic natural gas and a product of carbon-coated alumina particles therefrom, comprising cracking said heavy oil in the presence of hydrogen in a particulate alumina bed at 1200°–1600° F., 300–700 psia total pressure, and 50–200 psia partial pressure hydrogen, removing from said bed carbon-coated alumina particles as a product at least a portion of which is used for the production of aluminum chloride, a heavy aromatics stream, and a light gas stream, removing from said light gas stream acid gas contaminants, light aromatics, water, and hydrogen, to produce a synthetic natural gas product, and producing hydrogen for said cracking reaction by partially oxidizing a portion of said heavy oil and said separated heavy aromatic stream to produce a synthesis gas which is treated to remove acid gas components and is shifted to increase its hydrogen content and recycling hydrogen separated from said light gas stream to said cracking reaction.

4,374,019
PROCESS FOR CRACKING HIGH-BOILING HYDROCARBONS USING HIGH RATIO OF CATALYST RESIDENCE TIME TO VAPOR RESIDENCE TIME

William P. Hettinger, Jr., Russell, and Stephen M. Kovach, Ashland, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 13, 1981, Ser. No. 263,398
Int. Cl.³ C10G 11/18
U.S. Cl. 208—120 70 Claims

1. A process for converting carbo-metallic oils to lighter products comprising:

(a) providing a converter feed containing 650° F.+ material, at least a portion of said 650° F.+ material containing components which will now boil below about 1025° F., said 650° F.+ material further being characterized by a carbon residue on pyrolysis of at least about one and by containing at least about 4 ppm of Nickel equivalents of heavy metals;

(b) bringing hot cracking catalyst particles into contact with said feed to form a stream comprising a suspension of said catalyst in said feed, at least a portion of said feed remaining unvaporized and depositing as a liquid on said catalyst particles, and causing the resulting stream to flow through a progressive flow reactor having an elongated reaction chamber which is at least in part vertical or inclined for a predetermined vapor residence time in the range of about 0.5 to about 10 seconds, at a temperature of about 900° F. to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight, the ratio of residence time of catalyst in the reactor to residence time of vapor in the reactor being maintained in the range of about 1.2:1 to about 12:1, whereby the catalyst carrying liquid feed is retained within the reactor for a sufficiently long time for at least a portion of the liquid carried by the catalyst to be cracked into lighter vapor products;

(c) separating said catalyst from the resultant cracking products;

(d) stripping adsorbed hydrocarbons from said separated catalyst;

(e) regenerating said catalyst with oxygen-containing combustion-supporting gas under conditions of time, temperature and atmosphere sufficient to reduce the carbon on the catalyst to about 0.25% by weight of less, while forming a gaseous combustion product comprising CO and/or CO_2; and

(f) recycling the regenerated catalyst to the reactor for contact with fresh converter feed.

4,374,020
CATALYTIC HYDROCONVERSION PROCESS WITH CATALYST RETAINER

Cesar A. Trevino, Baytown, and Richard G. Stellman, Seabrook, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 840,928, Oct. 11, 1977, abandoned, which is a division of Ser. No. 720,556, Sep. 7, 1976, abandoned. This application Mar. 29, 1979, Ser. No. 25,227
Int. Cl.³ C10G 45/08, 45/60, 47/10
U.S. Cl. 208—216 R 6 Claims

1. A catalytic process for the hydroconversion of mineral oil which comprises (a) first contacting a mineral oil feedstock and a hydrogen-containing gas in an upright reaction zone with a layer of spherical hydroconversion catalyst support and/or retainer which is larger than a conventional catalyst subsequently employed in the process and which consists essentially of alumina containing up to 6% by weight of silica as a support, and from about 2 to about 20% by weight of Group VI-B metal and about 0.5 to about 10% by weight Group VIII metal, each in the form of metals, their oxides or sulfides, and having a diameter of greater than 6 mm up to about 30 mm, a surface area above 200 m^2/gm and a crush strength above 70 pounds, at an elevated temperature of 100°–500° C., a total pressure of 5.0–10,000 psig, a liquid hourly space velocity from about 0.2 to about 12 and from about 300 to 10,000 cubic feet of added hydrogen per barrel of feed, said layer of spherical catalyst support and/or retainer being disposed above and below said conventionally employed catalyst bed having a depth sufficient to require inert pellets, balls or spheres as a retainer and/or support for said conventionally employed catayst; (b) then contacting said feed in said reaction zone with said conventional extruded smaller sized hydroconversion catalyst at the same operating conditions; (c) followed by contacting said feed with another layer of said spherical hydroconversion catalyst support and/or retainer as set out in step (a) and (d) recovering the hydroconverted oil from the reaction zone.

4,374,021
METHOD FOR CONTROLLING A PRETREATMENT PROCESS

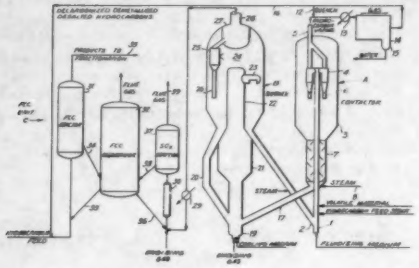
David B. Bartholic, Watchung, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Jan. 19, 1981, Ser. No. 225,927
Int. Cl.³ C10G 25/09, 25/12
U.S. Cl. 208—251 R 30 Claims

1. In a process for decarbonizing, demetallizing and/or desalting a hydrocarbon feed stock by:

contacting, in a selective vaporization step, for a short hydrocarbon residence time of less than 3 seconds at an elevated contact temperature, the feed stock with an inert

solid contact material in a confined rising vertical column to vaporize a major portion of the feed stock and to provide, as combustible deposits on the contact material, an unvaporized minor portion of the feed stock which includes high Conradson Carbon components and/or metal-containing components of the feed stock; separating the vaporized major portion of the feed stock from the contact material bearing the combustible deposits and quenching to arrest thermal cracking; contacting in a combusion step the contact material, bearing the combustible deposits, with an oxidizing gas to oxidize the combustible deposits and generate heat, whereby the contact material is heated by combustion of the combustible deposits; and recycling the so-heated contact material to contact further feed stock in the selective vaporization step, the improvement comprising:



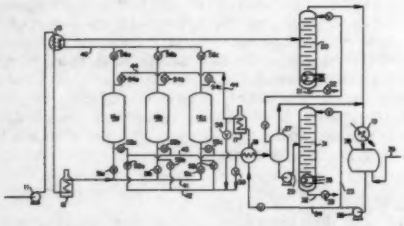
contacting the contact material in the combustion step with less than the stoichiometric amount of oxidizing gas, required to oxidize completely the combustible deposits, so that oxidizable high Conradson Carbon and/or metal-containing components of the combustible deposits are only partially oxidized to carbon monoxide and so that there is a reducing atmosphere in the combustion step.

4,374,022

CONSTANT PRESSURE SEPARATION OF NORMAL PARAFFINS FROM HYDROCARBON MIXTURES

Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1980, Ser. No. 189,353
Int. Cl.³ C25G *25/03*
U.S. Cl. 208—310 Z **10 Claims**



1. In an isobaric process for separating normal paraffins from non-normal hydrocarbons in a feed stream containing between 10 and 40 mol percent normal paraffins having 10 to 25 carbon atoms and non-normal hydrocarbons by (1) the selective adsorption of normal paraffins by passage of said feed stream through a molecular sieve adsorbent bed, (2) cocurrent purge with n-hexane to sweep out void space vapor containing a high concentration of non-normal hydrocarbons from the effluent end of the bed, (3) countercurrent purge with n-hexane to desorb normal paraffin adsorbate from the bed, (4) recovery of n-hexane from said separated normal paraffins and non-normal hydrocarbons, and (5) recycling of said n-hexane for purging of said bed, the improvement comprising diverting a portion of the desorption effluent from said countercurrent purge step as a source of said n-hexane used for cocurrent purge, the quantity of said countercurrent purge effluent diverted as cocurrent purge being that necessary to achieve a desired degree of separation of said normal paraffins and non-normal hydrocarbons and comprising from about 2.5 to about 5 bed volume voids, whereby the equipment size and energy consumption for the processing of said recycle n-hexane is reduced, without need to increase the adsorbent bed size to adsorb the additional normal paraffins introduced to the bed with the desorption effluent used as cocurrent purge gas.

4,374,023

PROCESS FOR RECOVERING HYDROCARBONS FROM A DIATOMITE-TYPE ORE

Bruce W. Davis, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 26, 1981, Ser. No. 315,317
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—11 LE **21 Claims**

1. A process for recovering hydrocarbons from diatomite ore comprising:

(a) contacting a diatomite ore containing hydrocarbons with an effective amount of a C_4–C_{10} alcohol or mixture of alcohols;

(b) contacting the diatomite ore-alcohol mixture with an aqueous alkaline solution to separate the mixture into a hydrocarbon phase and an alkaline aqueous-diatomaceous ore fraction; and

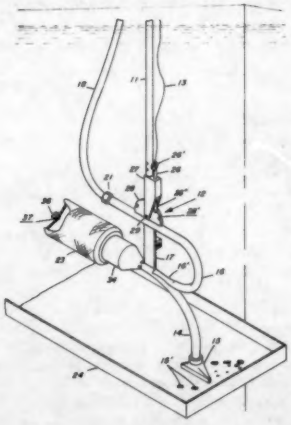
(c) recovering the alcohol-hydrocarbon phase from step (b).

4,374,024

UNDERWATER SUCTION DEVICE FOR IRRADIATED MATERIALS

Arthur V. Peloquin, Danville, and Frank D. Qurnell, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 17, 1981, Ser. No. 234,957
Int. Cl.³ B01D *29/20*
U.S. Cl. 210—241 **2 Claims**



1. A remotely operated suction device for underwater collection of irradiated materials, comprising:

a source of pressurized water;

suction tube means for receiving irradiated materials;

filter means for capturing at least some of said irradiated materials, mounted on said suction tube means;

injection tube means for injecting water from said source of pressurized water into said suction tube means;

means for maneuvering said injection tube means in a pool of water;

means for pivotally coupling said means for maneuvering with said injection tube means, including means for latching said means for pivotally coupling in any one of a plurality of discrete positions within the range of motion of said means for pivotally coupling, said means for pivotally coupling including a curved portion defining a plurality of spaced detents and said means for latching including a plunger biased toward said curved portion, said plunger including a tip for cooperatively engaging a selected one of said plurality of spaced detents; and

means for remotely releasing said means for latching, whereby said injection tube means may be repositioned on said means for maneuvering and irradiated materials are remotely collected underwater.

4,374,025

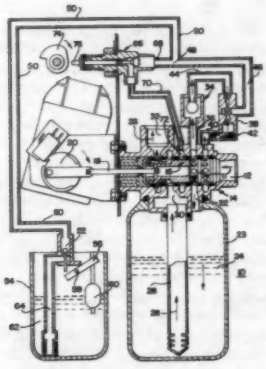
WATER CONDITIONING REGENERATION CONTROL

Harvey L. Loke, 350 9th St. SW., Wells, Minn. 56097

Filed Dec. 24, 1981, Ser. No. 334,131

Int. Cl.³ C02B 1/22

U.S. Cl. 210—140 **9 Claims**



1. A water conditioning system including a water inlet for receiving water to be treated; a water outlet for emitting treated water; a treatment tank containing a supply of resinous material for conditioning of the water; a brine tank; a regeneration control mechanism in communication with said inlet, outlet, treatment tank and brine tank comprising control valve means which performs the steps of a regeneration cycle at selected time intervals; a brine valve disposed between said brine tank and said regeneration control mechanism; and an injector system associated with said regeneration control and disposed between said brine valve and said treatment tank including a fluid port in communication with said brine tank through said brine valve and in communication with said water inlet through said control valve, an injector having a first orifice in communication with said water inlet, a second orifice in communication with said treatment tank through said control valve, and an area between said orifices in communication with said fluid port, and a flow control valve disposed between said injector and said treatment tank operative such that when brine fluid is flowing from said brine tank to said treatment tank, the flow is substantially unrestricted, but when said flow from said brine tank ceases, the flow of water to said treatment tank is substantially restricted so as to prolong the interaction between said resin and said brine.

4,374,026

BASKET FILTER

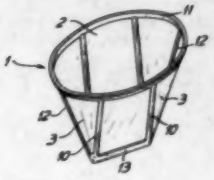
Albert Greutert, Sachseln, Switzerland, assignor to Maxs AG, Switzerland

Filed Apr. 20, 1981, Ser. No. 255,204

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016729

Int. Cl.³ B01D 29/06

U.S. Cl. 210—493.5 **10 Claims**



1. Basket filter made of perforated metal foil which is developable in one plane, with a form which merges from a round opening into a straight line bottom edge, comprising at least one rectangular metal foil part and at least two metal foil elements in the form of sectors of a circle, the rectangular metal foil part being folded at an angle in the middle of and transversely to its longitudinal edge to define the bottom edge, and the longitudinal edges of the rectangular metal foil part being connected to the straight line edges of the metal foil elements in the form of sectors of a circle.

4,374,027

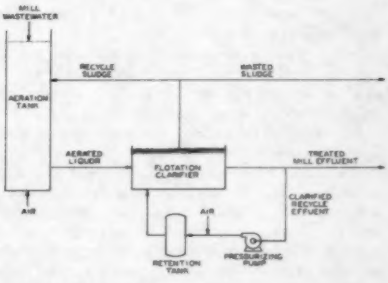
PROCESS FOR THE SECONDARY TREATMENT OF WASTEWATER

David E. Severeid, Shelton, and Daryl D. Jech, Seattle, both of Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 875,327, Feb. 6, 1978, abandoned. This application Feb. 26, 1979, Ser. No. 14,853

Int. Cl.³ C02F 3/12

U.S. Cl. 210—608 **9 Claims**



1. A process for the secondary treatment of wastewater by a modified air activated sludge system comprising

aerating wastewater containing bacteria, under conditions in which bacteria growth occurs, by continuously metering diffused air into a complete mix reactor until the BOD level of the wastewater is reduced by at least 90%, the food to microorganism ratio of the wastewater treatment system being greater than one,

introducing the aerated wastewater to a flotation cell to separate suspended solids including bacteria from the wastewater by dissolved air flotation clarification,

recycling said suspended solids and bacteria to said aeration

step in an amount sufficient to maintain said food to microorganism ratio and

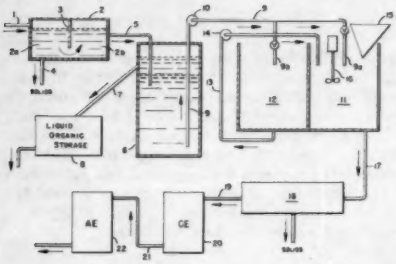
removing and disposing of the remaining reduced BOD level wastewater.

4,374,028

PROCESS FOR WASTE WATER PURIFICATION

Mario Medina, Matthews, N.C., assignor to Harry Rosen, Longmeadow, Mass.

Filed Oct. 15, 1981, Ser. No. 311,547
Int. Cl.³ C02F *1/24, 1/42*
U.S. Cl. 210—669 **2 Claims**



1. A process for the purification of an aqueous waste stream, particularly one of industrial origin, contaminated with orangic and inorganic materials, which comprises:

(a) conducting an aqueous waste stream to a first sedimentation zone provided with baffle means which extends across said first sedimentation zone from above the surface of said waste stream to a short distance above the bottom of said first sedimentation zone, said baffle means dividing the zone into connected inlet and outlet sections wherein water-insoluble materials of densities higher than that of water are removed from the waste stream as the bottom from the inlet section of said zone;

(b) removing said waste stream from the upper portion of said sedimentation zone and introducing it to a flotation zone of relatively small diameter as compared to its height, wherein water-insoluble and water-immiscible liquid materials of densities lower than water are removed from said waste stream as the upper layer of said zone; said flotation zone comprising upper and lower sections separated by screen means, said aqueous waste stream from said sedimentation zone being introduced to said flotation zone below said screen means, said screen means preventing water-insoluble solid materials having a density lower than that of water from entering said upper layer:

(c) conducting said waste stream from said flotation zone to an adsorption zone wherein there is added to said aqueous waste stream finely divided activated carbon for adsorbing water-insoluble and water-immiscible materials, and the resulting slurry is subjected to agitation;

(d) passing said slurry through a solids separation zone wherein carbon particles having water-insoluble and water-immiscible materials adsorbed thereon and other solids suspended in said aqueous waste stream are separated from said waste stream; and

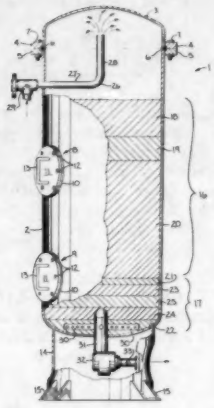
(e) conducting said aqueous waste stream to a cation exchange zone containing a cation exchange resin in the hydrogen form to remove metallic cations.

4,374,029

REGENERATIVE FILTER

Rajan A. Jaisinghani, Stoughton, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed May 4, 1981, Ser. No. 260,422
Int. Cl.³ B01D *15/00, 23/16*
U.S. Cl. 210—671 **2 Claims**



2. The method of separating oil from water comprising the steps of forming a multi-layer filter bed, said filter bed comprising a column of finely divided particles separated into at least three horizontal layers including a top layer, an intermediate layer and a bottom layer, said top layer being coprised of anthracite particles having an effective size of 0.75 to 0.85 mm and a maximum uniformity coefficient less than 2.0, said intermediate layer being composed of silica sand particles having an effective size of 0.4 to 0.55 mm and a maximum uniformity coefficient less than 1.5, said bottom layer being composed of garnet sand particles having an effective size of 0.25 to 0.35 mm, a maximum uniformity coefficient less than 1.8, and a depth of about 20 inches, the ratio of the depth of the top layer to that of the intermediate layer is about 2:3, the ratio of the depth of the intermediate layer to said bottom layer is about 1:5, said filter bed being supported within the column by a strata of relatively coarse support particles located beneath the bottom layer, flowing oil-contaminated water downwardly through the bed wherein the oil is adsorbed on the particles of the bed, regenerating the filter bed after a period of use by backwashing, said backwashing comprising the steps of introducing water under pressure into the lower end of the bed and flowing the water upwardly through said bed, and thereafter separately introducing air substantially free of water at a volume of 2 to 4 cfm/sq.ft. of filter bed into the lower end of the bed and flowing the air upwardly through said bed, and finally passing a second volume of water upwardly through said bed.

4,374,030

METHOD FOR SEPARATING A DISPERSED PHASE FROM A CONTINUOUS PHASE

Grover C. Franklin, Jr., 2250 Warmouth St., San Pedro, Calif. 90732

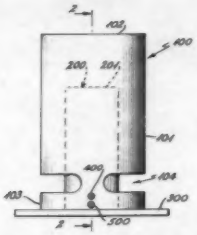
Continuation-in-part of Ser. No. 225,328, Jan. 15, 1981, Pat. No. 4,336,114, which is a division of Ser. No. 18,054, Mar. 6, 1979, Pat. No. 4,272,461. This application Nov. 5, 1981, Ser. No. 318,446
Int. Cl.³ B01F *3/04*
U.S. Cl. 210—758 **4 Claims**

1. A process for separating a clear liquid from a slurry comprising a continuous phase and a dispersed phase comprising immersing vertically in the slurry an apparatus comprising

(a) an inner cylindrical member comprising an elongated

tube having upper and lower ends and a plurality of turbines, which are free to rotate about the longitudinal axis thereof mounted within the tube, the turbines being spaced apart from one another and so constructed that adjacent turbines have different rotational direction or velocity, the tube having a solid, unperforated wall;

(b) an outer cylindrical member comprising an elongated tube having upper and lower ends and a plurality of openings in the lower half of the tube wall, the outer and inner cylindrical members being arranged in a concentric manner;



(c) a base member, to one surface of which the lower ends of the inner and outer cylindrical members are attached so that the lower ends are completely sealed;

(d) a gas inlet pipe for introducing gas bubbles into the lower end of at least one of the cylindrical members; and

(e) a conduit means for removing the continuous phase from the bottom of the inner cylindrical member, pumping a gas into the apparatus through the gas inlet pipe, circulating the slurry through the apparatus, and removing the clear liquid collected within the inner cylindrical member and at the bottom thereof.

4,374,031

METHOD FOR MANUFACTURING POLYESTER FIBERS WITH GOOD ADHESION TO RUBBER

Kazushige Kudo, Joyo; Shigeo Yamamoto, and Shigemitsu Murase, both of Uji, all of Japan, assignors to Unitika Limited, Osaka, Japan

Filed May 29, 1981, Ser. No. 268,310

Claims priority, application Japan, Jun. 6, 1980, 55-76944

Int. Cl.³ D06M *15/12, 15/36*

U.S. Cl. 252—8.8 **13 Claims**

1. A spin finish for polyester fibers to improve adhesion to rubber comprising a lubricating agent and surfactant and

(a) from about 5 to about 40 percent by weight of the finish of an epoxy compound,

(b) from about 3 to about 30 percent by weight of the finish of a blocked isocyanate compound, and

(c) from about 2 to about 30 percent by weight of the finish of a polyoxyalkylene amine compound obtained by reacting 3 to 20 mols of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide with an organic amine containing >NH or $-NH_2$ groups.

4,374,032

LUBRICANT COMPOSITION CONTAINING BORATED OXAZOLINE FRICTION REDUCER

Robert M. Gemmill, Pitman, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 28, 1980, Ser. No. 134,849

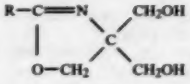
Int. Cl.³ C10M *1/54*

U.S. Cl. 252—49.6 **7 Claims**

1. A lubricant composition comprising a major proporation of an oil of lubricating viscosity or a grease therefrom and a friction-reducing amount of the compound prepared by reacting tris(hydroxymethyl)aminomethane with a carboxylic acid of the formula:

$$R—COOH$$

wherein R is a C_9 to C_{49} hydrocarbyl group, the reaction being carried out at from about 80° C. to about 250° C., the final temperature being sufficiently high to form an intermediate of the formula:



followed by reacting said intermediate, at from about 50° C. to about 300° C., with a boron-containing compound selected from the group consisting of boric acid and a borate of the formula:

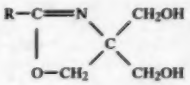
$$(R'O)_xB(OH)_y$$

wherein R' is a C_1 to C_6 alkyl, x is 1 to 3 and y is 0 to 2.

7. A method of reducing fuel consumption in an internal combustion engine comprising lubricating said engine with a lubricating oil composition comprising a major proportion of a lubricating oil and a fuel consumption reducing amount of the compound prepared by reacting tris(hydroxymethyl)aminomethane with a carboxylic acid of the formula:

$$R—COOH$$

wherein R is a C_9 to C_{49} hydrocarbyl group, the reaction being carried out at from about 80° C. to about 250° C., the final temperature being sufficiently high to form an intermediate of the formula:



followed by reacting said intermediate, at from about 50° C. to about 300° C., with a boron-containing compound selected from the group consisting of boric acid and a borate of the formula:

$$(R'O)_xB(OH)_y$$

wherein R' is a C_1 to C_6 alkyl, x is 1 to 3 and y is 0 to 2.

4,374,033

DISPERSANT AND LUBRICATING OIL CONTAINING THE DISPERSANT

Robert E. Malec, Ladue, Mo., assignor to Edwin Cooper, Inc., St. Louis, Mo.

Filed Jun. 18, 1981, Ser. No. 274,827

Int. Cl.³ C10M *1/20, 1/32, 1/54*

U.S. Cl. 252—49.6 **16 Claims**

1. A dispersant suitable for use in lubricating oil made by a process comprising reacting at 100°–300° C.

(a) an amino pyrrolidone intermediate made by reacting about 0.5–2.5 moles of butyrolactone with about 1 mole of an ethylene polyamine, at 100°–300° C.

(b) about 1–3 moles of an aliphatic hydrocarbon-substituted succinic anhydride, acid or lower alkyl ester thereof wherein said hydrocarbon substituent has a molecular weight of about 700–100,000, and

(c) a boronating agent in an amount sufficient to impart

about 0.01–1.5 weight percent boron into the final product.

4,374,034

POLYMERIC COMPOSITIONS, METHOD FOR THEIR PREPARATION, AND LUBRICANTS CONTAINING THEM

Lester E. Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 8,736, Feb. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 433,322, Jan. 14, 1974, Pat. No. 4,194,985. This application Apr. 16, 1980, Ser. No. 140,945

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A **9 Claims**

1. A method for preparing a composition of matter which comprises polymerizing, under free radical polymerization conditions and at a temperature of about 30°–90° C.:

(A) At least one ethylenically unsaturated monomer having from 3 to about 10 carbon atoms and a terminal olefinic bond and selected from the group consisting of unsaturated monohydric and polyhydric alcohols and carboxylic acid esters thereof, esters of unsaturated carboxylic acids and saturated alcohols, vinyl cyclic compounds, unsaturated ethers, unsaturated ketones, amides of unsaturated carboxylic acids, unsaturated aliphatic hydrocarbons, alkenyl halides and unsaturated nitriles; in the presence of

(B) At least one oil-soluble dispersant which is nonpolymerized and incapable of addition polymerization and which is characterized by the presence within its molecular structure of a substantially saturated oil-solubilizing group containing at least about 30 aliphatic carbon atoms and a polar group bonded to said oil-solubilizing group;

with the proviso that said dispersant B is not the reaction product of a substantially saturated hydrocarbon-substituted or halohydrocarbon-substituted succinic acid or anhydride with an alcohol;

the amount of said dispersant B being sufficient to produce a stable solution or dispersion of the resulting polymer in a substantially inert diluent.

7. A composition prepared by the method of any of claims 1–6.

9. A lubricating composition comprising a major amount of a lubricating oil and a minor amount, sufficient to improve dispersancy, extreme pressure properties or viscosity, of a composition according to claim 7.

4,374,035

ACCELERATED RELEASE LAUNDRY BLEACH PRODUCT

Frank P. Bossu, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 13, 1981, Ser. No. 282,483

Int. Cl.³ C11D *17/00*

U.S. Cl. 252—91 **11 Claims**

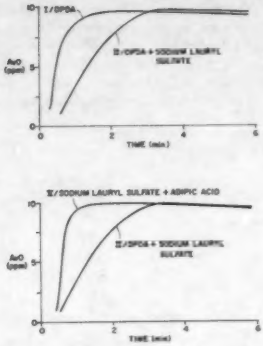
1. A dry, granular laundry bleach product in a pouch comprising:

I. a peroxyacid bleach selected from the group consisting of the hydrotropic or hydrophilic peroxyacid bleaches,

II. a surfactant at level of at least about 10% by weight of the peroxyacid bleach, said surfactant selected from the group consisting of peroxyacid compatible synthetic detergents and fatty acid soaps, and,

III. a water-soluble, peroxyacid compatible acid additive, said acid having a pK_a of from about 2 to about 7,

said pouch consisting of a water-insoluble but water-permeable fibrous material; whereby said acid additive accelerates the release of said bleach from the pouch into laundry wash liquor in the presence of said surfactant.



4,374,036

COMPOSITION AND CONCENTRATE USEFUL FOR MAKING A FOUNTAIN SOLUTION FOR LITHOGRAPHIC PRINTING OPERATIONS

Ralph D. Canale, Long Island City; Albert S. Canale, Massapequa, and Harry Papazian, Long Island City, all of N.Y., assignors to Michael A. Canale, Long Island City, N.Y., by said Harry Papazian

Continuation-in-part of Ser. No. 140,689, Apr. 16, 1980, Pat. No. 4,340,509. This application Nov. 19, 1980, Ser. No. 208,253

Int. Cl.³ B41L *25/00;* **B41M** *1/06;* **C11D** *3/075, 3/43*

U.S. Cl. 252—135 **18 Claims**

1. A composition suitable for production of a substantially neutral fountain solution, which consists essentially of 15 to 40% by weight tetrapotassium pyrophosphate; 15 to 40% by weight monosodium phosphate; 1 to 15% by weight of a sequestrant; 0.5 to 6% by weight of a water-soluble polyethylene glycol; 0.5 to 4% by weight sodium carboxymethyl cellulose; 2 to 6% by weight of a low- or non-foaming nonionic detergent; 0.5 to 5% by weight of an anionic detergent which is selected from the group consisting of alkyl orthophosphates and salts thereof, alkyl polyphosphates and salts thereof, and mixtures of the foregoing; and 0.15 to 2.7% of a polysiloxane.

4,374,037

METHOD FOR PREPARING DIVALENT-EUROPIUM-ACTIVATED CALCIUM SULFIDE PHOSPHORS

Tatsuo Takahashi, Isehara, Japan, assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,417

Int. Cl.³ C09K *11/12, 11/14, 11/46*

U.S. Cl. 252—301.4 S **8 Claims**

1. A method for preparing a divalent-europium-activated calcium sulfide phosphor comprising reacting a molten mixture consisting essentially of calcium chloride and europium chloride with gaseous carbon disulfide at temperatures between 850° and 1200° C. for 1 to 6 hours.

4,374,038

METHOD PRODUCING STEAM-LIKE FUMES FOR TOY ENGINE

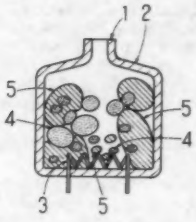
Muneo Tamura, 195-1, 8-414, Junocho 2-Chome, Omiya-Shi, Saitama 330, Japan

PCT No. PCT/JP80/00095, § 371 Date Jan. 11, 1981, § 102(e) Date Jan. 11, 1981, PCT Pub. No. WO80/02514, PCT Pub. Date Nov. 27, 1980

PCT Filed May 7, 1980, Ser. No. 232,022

Int. Cl.³ C09K *3/30*; A63H *19/14*

U.S. Cl. 252—305 **1 Claim**



1. In a method for producing fumes appearing like steam for the chimney of a toy steam engine, the method comprising the steps of depositing water and oil having a non-affinity with the water in a container having an open end and an electrically conductive wire exposed to contact with said water and oil located adjacent the lowest part of the container, and passing current through said wire to raise the temperature of the oil and water sufficiently to cause the oil to burn and the water to evaporate.

4,374,039

ANTICLUMPING PRODUCTS AND TREATMENTS BASED ON AMIN SALTS

Joseph Schapira, Paris; Jacques Ruel, Saint Gratien; Jean C. Cheminaud, Chatou; Robert Sadlo, Gennevilliers, and Robert Christian, Pantin, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France

Filed Jul. 11, 1980, Ser. No. 168,644

Claims priority, application France, Jul. 13, 1979, 79 18295

Int. Cl.³ C05G *3/00*; C09K *3/00*

U.S. Cl. 252—384 **30 Claims**

1. Anti-clumping products for salts, simple or complex fertilizers, said products comprising, as active substance an effective amount of at least one organic solvent-soluble salt of an alkanolamine, an alkylamine, a cycloalkylamine or an aromatic amine, having from 2 to 22 carbon atoms, with an alkyl naphtylene sulfonic acid whose alkylaryl radical includes from 11 to 32 carbon atoms.

4,374,040

AMINOALKYLENEPHOSPHONIC ACIDS AND SALTS THEREOF AND THEIR USE IN AQUEOUS SYSTEMS

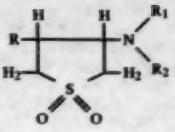
Joseph G. E. Fenyes, Germantown, and John D. Pera, Memphis, both of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Division of Ser. No. 63,275, Aug. 2, 1979, which is a division of Ser. No. 914,250, Jun. 9, 1978, Pat. No. 4,181,806. This application Aug. 19, 1980, Ser. No. 179,619

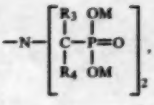
Int. Cl.³ C23F *11/16*

U.S. Cl. 252—389 A **17 Claims**

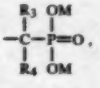
1. A process for inhibiting the corrosion of metal surfaces in contact with an aqueous system which comprises adding to said system an aminoalkylenephosphonic acid or an alkali metal salt thereof in an amount sufficient to inhibit the corrosion of the metal surfaces having the formula:



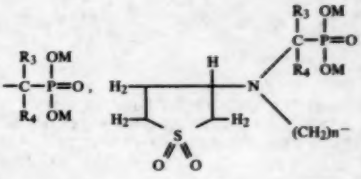
wherein R is hydrogen or



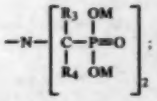
R_1 is hydrogen or



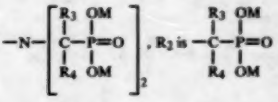
R_2 is an alkyl group containing 1 to 4 carbon atoms, 2-hydroxyethyl, 2-hydroxypropyl, 3-chloro-2-hydroxypropyl,



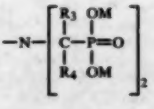
or



R_3 and R_4 may be the same or different and are selected from the group consisting of hydrogen and an alkyl group containing 1 to 4 carbon atoms; n is 1 or 2; M is hydrogen or an alkali metal; with the proviso that when R is



and with the further proviso that R_1 is hydrogen only when R_2 is



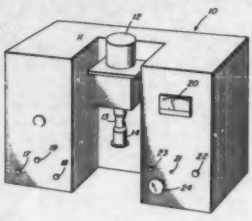
4,374,041
TESTING REAGENT

Wayne R. Matson, Ayer, Mass., assignor to Environamental Sciences Associates, Inc., Bedford, Mass.

Division of Ser. No. 666,664, Mar. 15, 1976, which is a continuation of Ser. No. 505,149, Sep. 11, 1974, abandoned, which is a division of Ser. No. 447,376, Mar. 1, 1974, abandoned. This application Apr. 24, 1978, Ser. No. 899,389

Int. Cl.³ C09K *3/00*

U.S. Cl. 436—60 **12 Claims**



5. A composition for treating a human blood sample preparatory to electrochemically detecting and measuring the lead content of said sample, said composition comprising:

an electrolytic solution containing a dissovled chromic compound and a dissolved calcium compound, the chromic and calcium ions together being present in concentration of about 0.12 F, dissolved mercuric chloride in a concentration of about 0.000225 F, hydrazine in a concentration of about 0.019 F, phosphoris acid in a concentration of about 0.01 F, a dispersing agent, and a source of hydrogen ions to bring said composition to pH about 1.

4,374,042
METHOD OF REACTIVATING A CATALYTIC COMPOSITE OF A CARRIER MATERIAL AND A MERCAPTAN OXIDATION CATALYST

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 170,372, Jul. 21, 1980, Pat. No. 4,308,169, which is a continuation-in-part of Ser. No. 973,303, Dec. 26, 1978, Pat. No. 4,213,877. This application Apr. 24, 1981, Ser. No. 257,041

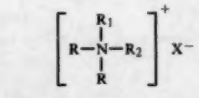
The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.³ B01J *31/40;* **C10G** *19/02, 19/08, 29/00*

U.S. Cl. 252—412 **13 Claims**

1. A method of reactivating a deactivated mercaptan oxidation catalytic composite comprising a carrier material and a metal chelate, said method comprising contacting said composite at a temperature of between about 55° C. and about 175° C. with an aqueous solution of a quaternary ammonium compound and a saturated linear ionic compound having from about 9 to about 24 carbon atoms.

3. The method of claim **1** wherein said quaternary ammonium compound is represented by the structural formula:



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, R_1 is a substantially straight chain alkyl radical containing from about 5 to about 20 carbon atoms, R_2 is selected from the group consisting of aryl, aralkyl and alkaryl, and X is an anion.

7. The method of claim **1** wherein said linear ionic compound possesses an anionic portion wherein said anionic portion is selected from the group consisting of sulfonate, sulfate and carboxylate.

4,374,043
PREPARATION OF FLUIDIZABLE VANADIUM PHOSPHORUS OXIDE CATALYSTS USING A MIXED PHOSPHORUS SOURCE

Patricia R. Blum, Macedonia, and Mark L. Nicholas, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 220,624, Dec. 29, 1980, Pat. No. 4,317,778. This application Sep. 24, 1981, Ser. No. 305,066

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 **18 Claims**

1. A process for the preparation of a fluid bed oxidation catalyst containing the mixed oxides of vanadium and phosphorus comprising

(a) introducing at least one pentavalent vanadium compound into an organic liquid capable of reducing at least a portion of the vanadium to a valence state of +4;

(b) effecting reduction of at least a portion of the vanadium to a valence state of +4;

(c) contacting the vanadium with a mixed phosphorus component prior or subsequent to effecting said reduction, wherein said mixed phosphorus component comprises about 75–90 weight percent orthophosphoric acid and about 10–25 weight percent pyrophosphoric acid;

(d) comminuting the catalyst precursor resulting from steps (a) through (c);

(e) introducing the catalyst precursor into water prior or subsequent to said comminuting to form an aqueous slurry; and

(f) spray drying said slurry to form microspheroidal catalyst particles.

4,374,044
CORDIERITE BEAD CATALYST SUPPORT AND METHOD OF PREPARATION

Carl F. Schaefer, Flint, and Raymond E. Bedford, Burton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1981, Ser. No. 226,162

Int. Cl.³ B01J *21/16, 20/30, 35/08*

U.S. Cl. 252—455 R **6 Claims**

1. A thermally stable cordierite bead catalyst support having a high geometric surface area, high macro-porosity, and good crush strength, and having a dimpled or raspberry-like surface, said cordierite bead resulting from the disc pelletizing of a dry homogeneous mixture of talc, clay, alumina or its precursor powder and a combustible organic filler, together with a separate spray stream of water or of aqueous colloidal silica, the resulting beads being dried and fired to burn-out the organic filler and to form cordierite, said clay and the feed rate of said streams being such as to produce a plasticity of the materials when mixed on the rotating disc of the pelletizer sufficient to form small beads which agglomerate.

6. A process for preparing a cordierite bead catalyst support having a dimpled or raspberry-like surface with a high geometric surface area, which comprises dry mixing to form a substantially homogeneous material batch, about 32% talc, about 27% ball clay, about 26% alumina trihydrate and about 15% cellulose fiber, all by weight, feeding a stream of said dry material onto a rotating pelletizer disc, feeding a separate stream of colloidal silica onto said disc, the feed rates of the dry materials and of colloidal silica being such as to produce a dimpled or raspberry-like surfaced bead having about 28% by weight liquid and having sufficient silica to produce a bead which on firing contains cordierite as the principal phase, drying the resulting beads to remove free water, and firing the beads to burn-out said cellulose and cause the batch material to react to

form a cordierite body having high strength and high macroporosity.

4,374,045

GROUP IB METAL MODIFIED ZEOLITE CATALYSTS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 153,364, May 27, 1980, Pat. No. 4,276,438. This application Apr. 24, 1981, Ser. No. 257,060

Int. Cl.³ B01J *29/30*

U.S. Cl. 252—455 Z 11 Claims

1. A catalyst composition suitable for para-selective conversion of substituted aromatic compounds, said composition comprising:

a crystalline zeolite material characterized by a constraint index of within the approximate range of 1 to 12 and a silica to alumina mole ratio of at least 12;

said zeolite further comprising at least 0.25 weight percent of one or more Group IB metals incorporated into said zeolite in the form of a Group IB metal oxide and at least 0.25 weight percent of phosphorus incorporated into said zeolite in the form of an oxide of phosphorus.

4,374,046

HYDROCARBON DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 46,884, Jun. 8, 1979, Pat. No. 4,238,365, which is a division of Ser. No. 884,310, Mar. 7, 1978, Pat. No. 4,190,521. This application Nov. 17, 1980, Ser. No. 207,852

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ B01J *23/60*

U.S. Cl. 252—466 B 9 Claims

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.01 to about 5 wt. % zinc; wherein the platinum group, catalytically available nickel, zinc and alkali or alkaline earth components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrogenation conditions or in a mixture of these states; and wherein substantially all of the alkali or alkaline earth component is present in a positive oxidation state.

4,374,047

PROCESS FOR APPLICATION OF A CATALYTICALLY ACTIVE COATING CONTAINING PLATINUM, PALLADIUM OR RHODIUM OR THEIR MIXTURES TO A CARRIER AND PRODUCT MADE BY SAID PROCESS

Alfred Bozon, Erlensee; Eduard Lakatos, Linsengericht; Edgar Koberstein, Alzenau; Hans-Dieter Pletka, Freigericht, and Herbert Völker, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,252

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006398

Int. Cl.³ B01J *23/42, 23/44, 23/46*

U.S. Cl. 252—472 5 Claims

1. In a process for application of a coating or film to the surface of a porous catalyst carrier, said coating or film formed from an aqueous solution comprising as the essential catalytic elements necessary to effect catalytic conversion of the harmful components in the exhaust stream of an automotive engine, a member consisting of platinum, palladium, or rhodium and mixtures thereof as the catalytic active material of an exhaust purification catalyst by means of an aqueous solution of these metals to the surface of a porous catalyst carrier by a first step of filling the pores of the carrier with a preloading step, then impregnating with said aqueous solution of essential catalytic element and heating the impregnated carrier to thereby remove the liquid phase of the solution containing the catalytically active material employed in said impregnation; wherein the preloading is carried out with a liquid which is an aqueous solution containing at most 1% ammonium chloride.

4,374,048

ELECTRICALLY CONDUCTIVE POLYMERIC COMPOSITIONS

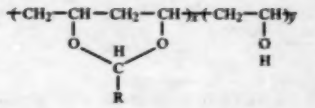
Oh-Kil Kim, Burke, Va., and Robert B. Fox, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 291,001

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—500 26 Claims

1. A cured electrically conductive polymeric composition consisting essentially of a poly(vinylacetal) polymer represented by the general formula:



wherein R is a radical of the base of an electron-rich donor aldehyde having an ionization potential from about 7 to about 10 eV, the ratio of x to y is from about 9:1 to about 1:9, and an amount up to about 50 weight percent of microcrystals of a salt represented by the formula:

$$X^{M+}[TCNQ\ ]_m\ \ [TCNQ^{\cdot}]_n$$

wherein x is a metal or a cation radical, said metal being selected from the group consisting of lithium, sodium, potassium, beryllium, magnesium, calcium, strontium, manganese, copper, silver and tin, and said cation radical being selected from the class consisting of ammonium, trialkyl-ammonium, N-alkyl-quinolium radicals with alkyl groups from 1 to 4 carbon atoms, m is 1 or 2, and n is 0 or 1.

4,374,049

ZINC OXIDE VARISTOR COMPOSITION NOT CONTAINING SILICA

Howard F. Ellis, Stephentown, N.Y., and Herbert Fishman, Pittsfield, Mass., assignors to General Electric Company

Filed Jun. 6, 1980, Ser. No. 157,097

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—519 4 Claims

1. A zinc oxide varistor composition free of the oxides of silicon and barium, comprising:

ZnO as a major constituent;

equimolar concentrations of about 0.5 mole percent of each of the oxides of Bi, Co, Mn, and Sn; and

about 2.0 mole percent of the oxide of Sb, about 1.0 mole percent of the oxide of Ni, and about 0.01 to about 0.10 mole percent of the oxide of B wherein the quantity of Ni is less than Sb and greater than B.

4,374,050
INERT ELECTRODE COMPOSITIONS

Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 10, 1980, Ser. No. 205,651
Int. Cl.³ H01B 1/06
U.S. Cl. 252—519 **35 Claims**

1. A metal composition suitable for use as an inert electrode in the electrolytic production of metal from a metal compound dissolved in a molten salt, the composition defined by the formula:

$$\left(\sum_{i=1}^{m}(M_i)F_{Mi}\right)\left(\sum_{j=1}^{q}(M_j)F'_{Mj}\sum_{i=1}^{m}(M_i)F'_{Mi}\right)_Z\left(\sum_{r=1}^{n}X_rF_{Xr}\right)_K$$

where $\sum_{i=1}^{m}F_{Mi}=1$; $\sum_{j=1}^{q}F'_{Mj}+\sum_{i=1}^{m}F'_{Mi}=1$ and

$$\sum_{r=1}^{n}X_rF_{Xr}=1;$$

z is a number in the range of 1.0 to 2.2; K is a number in the range of 2.0 to 4.4; M_i is a metal having a valence of 1, 2, 3, 4 or 5 and is the same metal or metals wherever M_i is used in the formula; M_j is a metal having a valence of 2, 3 or 4; M_i and M_j being different metals; X_r is at least one of the elements from the group consisting of O, F, N, S, C and B; m, p and n are the number of components which comprise M_i, M_j and X_r; F_{Mi}, F'_{Mj}, F'_{Mi} or F_{Xr} are the mole fractions of M_i, M_j and X_r and $0<\Sigma F'_{Mi}<1$ when $m>1$.

4,374,051
UTILIZATION OF NITROGEN CONTAINING HETEROCYCLIC DERIVATIVES AS PERFUME INGREDIENTS

Regula Näf, Geneva; Wilhelm Pickenhagen, Chavannes-des-Bois, and Anthony F. Morris, Gingins, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Jan. 26, 1981, Ser. No. 228,357
Claims priority, application Switzerland, Feb. 6, 1980, 934/80
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R **3 Claims**

1. A method for improving, enhancing or modifying the odorous properties of perfumes, perfume bases or perfumed articles which comprises the step of adding thereto at least one of the pyridine derivatives selected from the group consisting of:

a. 2-isopropenyl-pyridine,
b. 3-isopropenyl-pyridine,
c. 2-isopropyl-5-methyl-pyridine,
d. 2-methyl-5-isopropenyl-pyridine,
e. 2-isopropyl-5-acetyl-pyridine,
f. 2-methyl-5-acetyl-pyridine, and
g. 2-methyl-5-isopropyl-pyridine,

wherein the concentration of the pyridine derivative is between about 10 to about 100 ppm of the total weight of the perfume, perfume base or perfumed article composition.

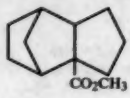
4,374,052
PERFUME COMPOSITION

Yoshiaki Fujikura, Tochigi; Yoshiaki Inamoto; Naotake Takaishi, both of Utsunomiya, and Motoki Nakajima, Saitama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 9, 1981, Ser. No. 241,855
Claims priority, application Japan, Mar. 14, 1980, 55-32435; Dec. 10, 1980, 55-174247
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R **4 Claims**

1. A perfume composition comprising:

the compound methyl tricyclo[5.2.1.0^{2,6}]decane-2-carboxylate of the formula (I):



(I)

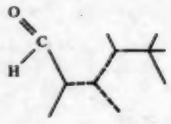
in an amount sufficient to afford a herbal note or essence to the composition; and an acceptable carrier therefor.

4,374,053
UNSATURATED ALDEHYDES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Philip T. Klemarczyk, Old Bridge; Robert P. Belko, Woodbridge, and Richard M. Boden, Monmouth Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,011
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R **3 Claims**

1. A process for augmenting or enhancing the aroma of a perfume or cologne comprising the step of adding to a perfume or cologne base, an aroma augmenting or enhancing quantity of at least one compound defined according to the generic structure:



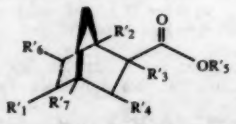
wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds.

4,374,054
USE IN PERFUMERY OF CARBOALKOXY ALKYL NORBORNANES

Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 206,466, Nov. 13, 1980, Pat. No. 4,312,888, which is a continuation-in-part of Ser. No. 133,870, Mar. 25, 1980, Pat. No. 4,319,036. This application Sep. 17, 1981, Ser. No. 303,163
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R **4 Claims**

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to a perfume composition or cologne base an aroma augmenting or enhancing quantity of at least one compound defined according to the generic structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; R_1' R_2' R_3' R_4' R_6' and R_7' are each selected from the group consisting of hydrogen and methyl and R_5' is a C_1–C_4 alkyl moiety with the provisos that:

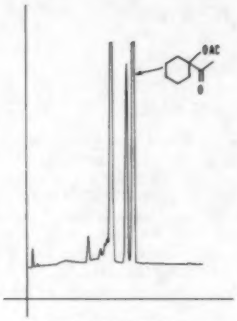
1. one of R_1', R_2', R_6' and R_7' is methyl and the other of R_1', R_2', R_6' and R_7' represents hydrogen;
2. R_3' and R_4' are not both methyl;
3. when the dashed line is a carbon-carbon double bond, R_1', R_3' and R_4' are not all hydrogen when R_2' is methyl.

4,374,055

ALKYL ESTERS OF 1-ALKANOYL CYCLOALKANOLS AND ORGANOLEPTIC USES THEREOF

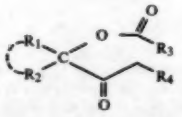
Ronald P. Schreck, Old Bridge, N.J.; Kenneth K. Light, North Ogden, Utah; John B. Hall, Rumson, N.J.; Frederick L. Schmitt, Holmdel, N.J.; Manfred H. Vock, Locust, N.J.; William L. Schreiber, Jackson, N.J.; Joaquin F. Vinals, Red Bank, N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 133,828, Mar. 25, 1980, Pat. No. 4,327,749.
This application Oct. 22, 1981, Ser. No. 314,002
Int. Cl.³ A61K *7/46*
U.S. Cl. 252—522 R **2 Claims**



GLC PROFILE FOR EXAMPLE I.

1. A process for augmenting or enhancing the organoleptic properties of a consumable material selected from the group consisting of perfume compositions, and colognes, comprising the step of adding to said consumable material an organoleptic property augmenting or enhancing quantity of at least one compound having the generic structure:



wherein R_1 and R_2 taken together complete a cycloalkyl moiety or a methyl, dimethyl or trimethyl cycloalkyl moiety containing five or six carbon atoms in the ring and wherein R3 is C_1–C_3 lower alkyl and R_4 is methyl or hydrogen.

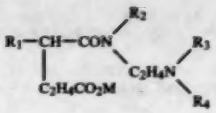
4,374,056

LOWLY IRRITATING DETERGENT

Hiroshi Watanabe, Funabashi, and Hajime Hirota, Tokyo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,225
Claims priority, application Japan, Nov. 27, 1980, 55-167156
Int. Cl.³ C07C *103/44, 103/50;* **C11D** *1/10, 1/94*
U.S. Cl. 252—546 **7 Claims**

1. A detergent comprising an amide-amine type amphoteric surface active agent represented by the following general formula (1):



(1)

wherein R_1 stands for an alkyl or alkenyl group having 6 to 20 carbon atoms, R_2 stands for H or C_2H_4OH, R_3 and R_4 are each H, C_2H_4OH, or $C_2H_4CO_2M$, and M stands for H, an alkali metal, ammonium or organic ammonium.

4,374,057

AQUEOUS DISPERSIONS OF FREE RADICAL-GENERATING POLYMERIZATION INITIATORS

Donald Goodman, Flemington, N.J.; Mario Q. Ceprini, Cedarhurst; Samuel Hoch, Brooklyn, both of N.Y., and Marvin Koral, Warren, N.J., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Aug. 3, 1981, Ser. No. 289,551
Int. Cl.³ B01J *31/02*
U.S. Cl. 252—426 **15 Claims**

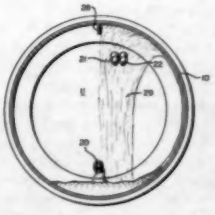
1. An aqueous dispersion of a free radical-generating polymerization initiator that is a shelf-stable liquid at temperatures at which the initiator can be stored safely comprising
   a. 10% to 50% by weight of a free radical-generating polymerization initiator that is liquid at temperatures at which it can be stored safely,
   b. 0.8% to 3% by weight of a suspending agent,
   c. 0.1% to 1.0% by weight of a wetting agent selected from the group consisting of anionic surfactants, nonionic surfactants, and mixtures thereof,
   d. 0 to 50% by weight of an antifreeze additive that is an alcohol having 1 to 3 carbon atoms, and
   e. 2% to 15% by weight of an organic solvent.

4,374,058

METHOD FOR PRODUCING POWDERED DETERGENT CONTAINING ALPHA OLEFIN SULFONATE

Burton Brooks, Bellevue, Wash., assignor to The Chemithon Corporation, Seattle, Wash.

Filed Oct. 26, 1981, Ser. No. 315,160
Int. Cl.³ C11D *11/00, 11/02, 1/37*
U.S. Cl. 252—556 **9 Claims**



1. A method for producing a powdered detergent containing an alkyl benzene sulfonate and an alpha olefin sulfonate, said method comprising the steps of:
   providing a first slurry containing neutralized alkyl benzene sulfonate without alpha olefin sulfonate;
   spray-drying said first slurry in a heated spray drying tower to produce dry, powdery particles containing alkyl benzene sulfonate;
   introducing said dry, powdery particles containing alkyl benzene sulfonate into the upstream end of a mixing zone;
   advancing said dry, powdery particles containing alkyl

benzene sulfonate toward said downstream end of the mixing zone;
lifting and dropping said particles containing alkyl benzene sulfonate as they undergo advancement in said mixing zone;
providing, at the upstream end of the mixing zone, a second slurry of neutralized alpha olefin sulfonate containing liquid water;
spraying said second slurry onto said dry powdery particles containing alkyl benzene sulfonate, as said particles undergo said lifting and dropping, to form composite particles of relatively uniform size and composition comprising said alkyl benzene sulfontate and said alpha olefin sulfonate;
the liquid water in said second slurry being absorbed into said composite particles to dry said second slurry;
and removing said composite particles as a relatively dry powder from the downstream end of said mixing zone.

4,374,059

PROCESS FOR MAKING FRICTION PRODUCTS

Harry H. Wagner, Ridgeway, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio

Continuation of Ser. No. 84,354, Oct. 12, 1979, Pat. No. 4,268,467. This application May 11, 1981, Ser. No. 262,324

Int. Cl.³ C08K *3/22*

U.S. Cl. 523—153 **6 Claims**

1. A shaped article of thermally-resistant, fiber-reinforced, friction material made from a composition comprising an effective quantity of inorganic heat-resistant fiber reinforcement admixed with an effective quantity of a thermosetting resin binder system and formed by a process comprising the steps of:
(a) enclosing a quantity of said composition to be molded to said desired shape within a thermally decomposable container of flexible encapsulating material,
(b) sealing said container,
(c) placing said sealed container and contents therein within a curing mold having a shape for said shaped article,
(d) heating and pressing said composition within said mold to cure said resin binder to bond the composition into said shaped article wherein said heating within said mold thermally decomposes said container; and
(e) opening said mold and removing said molded article.

4,374,060

PROCESS FOR THE PREPARATION OF CYCLIC HEXAPEPTIDE

Ruth F. Nutt, Green Lane, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 15, 1981, Ser. No. 283,404

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **4 Claims**

1. A process for the preparation of Cyclo(D-Trp-Lys-Val-Phe-N-Me-Ala-Tyr) which comprises cyclizing at a molar concentration of from 0.5 to 0.001, in a solvent system consisting of N,N-dimethylformamide, dimethylsulfoxide, or mixtures thereof, the following linear peptide which may optionally be protected by one or more blocking groups:
H-D-Trp-Lys-Val-Phe-N-Me-Ala-Tyr-OH
wherein the reaction is carried out in the presence of a tertiary amine or sodium bicarbonate and diphenylphosphorylazide as a cyclizing agent at from −30° to +5° C. over a period of from 1 to 50 hours.

4,374,061

MEANS AND METHODS FOR PURIFYING Clq, Clr AND Cls

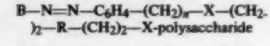
David H. Bing, Brookline, Mass., assignor to Center For Blood Research, Inc., Boston, Mass.

Filed Jul. 27, 1981, Ser. No. 287,139

Int. Cl.³ C07G *7/00*

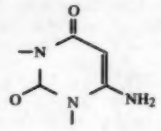
U.S. Cl. 260—112 R **8 Claims**

1. A resin capable of separating Clq, Clr and Cls from fluids comprising a protein selected from the class consisting of IgG, IgM and Fc fragments thereof having linked thereto at at least one histidine site thereof an organic arm,
said arm comprising a polysaccharide linked to said protein by a portion having the following formula:



$B—N=N—C_6H_4—(CH_2)_n—X—(CH_2)_2—R—(CH_2)_2—X\text{-polysaccharide}$

n=1,2, 3 or 4
X=O or NH
R=SO_2 or CH_2NHCH_2 or:



or:
$[—CH(OH)CONHCH_2]_2—$

or:
$—CH_2NHCONHCH_2—$

B=IgG, IgM or Fc fragments.

4,374,062

PROCESS FOR THE PRODUCTION OF PEPTIDES

Axel Kleemann, Hanau; Jurgen Martens, Alzenau, and Marc Samson, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

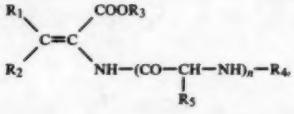
Filed Oct. 14, 1981, Ser. No. 311,454

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039053

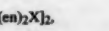
Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **10 Claims**

1. A process of producing peptides comprising asymmetrically hydrogenating a dehydropeptide of the formula



in which n is a whole number from 1 to 4, R_1 and R_2 are the same or different and are hydrogen, an alkyl group with 1 to 10 carbon atoms, or such a group substituted with a carboxyl group, a phenyl group which is unsubstituted or substituted in the 3 or 4 or in both the 3 and 4 positions by a hydroxyl, alkoxy, or acyloxy group or an indolyl which is unsubstituted or substituted in the 6 position by fluorine or chlorine or an indolyl group substituted by a methyl group, R_3 is hydrogen, an alkali metal, or a lower alkyl group with 1 to 4 carbon atoms, R_4 is hydrogen, an acetyl group or a chloroacetyl group and R_5 is hydrogen or an alkyl group having 1 to 4 carbon atoms with the proviso that when n is 2, 3, or 4, the individual groups R_5 are the same or different, in the presence of a chiral rhodium-complex which is either (1) a soluble coordination complex of a rhodium (I) compound and a chiral tertiary phosphine prepared by reaction of a chiral tertiary phosphine with (a) a complex of the formula



$[Rh(en)_2X]_2$,

wherein (en)2 is two molecules of an olefin or cycloolefin or 1

mole of a diolefin or cyclodiolefin and X is chlorine, bromine, or iodine, or (b) with a complex of the formula $[Rh(en)_2Y]$,

where Y is acetonylacetonate or a carboxylate group or (2) a cationic complex of the formula:

$$[Rh(en)_2A]^+Z^-$$

where A is a chiral, tertiary phosphine, and Z is a tetrafluoroborate, tetraphenyl borate, hexafluorophosphate, or perchlorate anion.

4,374,063

PROCESS FOR THE PREPARATION AND PURIFICATION OF GELATIN AND PYROGEN-FREE GELATIN SO PREPARED

George A. Consolazio, Burlington, and Gury Pano, Jamaica Plain, both of Mass., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,274

Int. Cl.³ C09H *3/02*

U.S. Cl. 260—118 **5 Claims**

1. A process of preparing an essentially pyrogen-free gelatin solution which comprises:

(a) conditioning cattle hides and/or tanner's stock in a caustic solution in a pyrogen-free vessel;

(b) water washing the hides and/or stock with pyrogen-free water;

(c) treating the hides and/or stock with an acid solution;

(d) extracting gelatin at a pH of from 3.7 to 4.7 from the hides and/or stock;

(e) filtering the extract through a low porosity filter; and

(f) recovering an essentially pyrogen-free gelatin solution.

4,374,064

METAL COMPLEXES OF DISAZO COMPOUNDS HAVING A 5-AMINO OR HYDROXY-3-CARBOXY OR METHYL-1- SUBSTITUTED PHENYLPYRAZOLE COUPLING COMPONENT RADICAL

Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

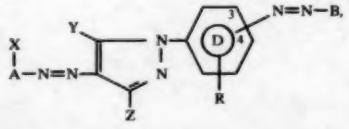
Filed Apr. 28, 1980, Ser. No. 144,380

Claims priority, application Switzerland, May 2, 1979, 4117/79

Int. Cl.³ C09B *45/26, 45/28, 45/30, 45/32*

U.S. Cl. 260—147 **54 Claims**

1. A metal complex of a disazo compound of the formula



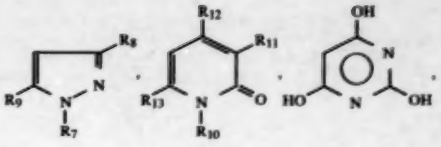
(I)

or a salt thereof each cation of which is non-chromophoric, wherein

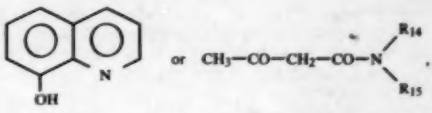
A–X is the radical of a diazo component,

wherein X is a metallizable group or a substituent convertible to a metallizable group, with the proviso that X is ortho to the —N=N— radical,

B is the radical of a coupling component of the formula

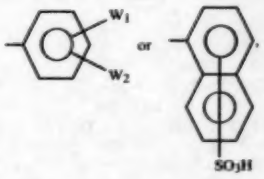


(b1) (b2) (b3)



(b4) (b5)

wherein R_7 is hydrogen,



wherein W_1 is hydrogen, chloro, methyl, methoxy, cyano, nitro, carboxy, $—SO_2NW_3W_4$ or sulfo,

wherein each of W_3 and W_4 is independently hydrogen, C_{1-4}-alkyl or C_{2-4}-alkyl substituted in the 2-, 3- or 4-position by hydroxy or C_{1-4}-alkoxy, and

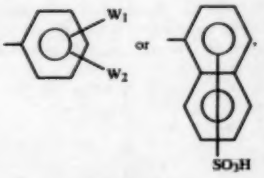
W_2 is hydrogen, chloro, methyl, methoxy or carboxy,

R_8 is C_{1-4}alkyl, phenyl, carboxy or $—CONW_3W_4$,

wherein each of W_3 and W_4 is independently hydrogen, C_{1-4}alkyl or C_{2-4}-alkyl substituted in the 2-, 3- or 4-position by hydroxy or C_{1-4}alkoxy,

R_9 is —OH or $—NH_2$,

R_{10} is hydrogen; amino; phenylamino; C_{1-8}alkyl; C_{6-9}cycloalkyl; cycloalkyl substituted by 1, 2 or 3 alkyl groups, the total number of carbon atoms therein being 6 to 9, inclusive; carboxy(C_{1-4}alkyl); C_{2-4}alkyl substituted by hydroxy, methoxy, ethoxy or sulfo, with the proviso that any hydroxy, methoxy or ethoxy substituent is in the 2-, 3- or 4-position;



wherein W_1 and W_2 are as defined above,

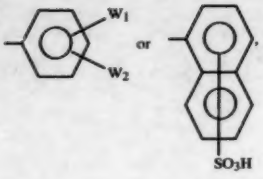
R_{11} is hydrogen, carboxy, sulfo, acetyl or cyano,

R_{12} is hydrogen, hydroxy, methyl, carboxy, phenyl or sulfomethylene,

R_{13} is hydrogen, hydroxy or methyl, with the proviso that at least one of R_{12} and R_{13} is hydroxy,

R_{14} is hydrogen or C_{1-4}alkyl, and

R_{15} is C_{1-8}alkyl; C_{6-9}cycloalkyl; cycloalkyl substituted by 1, 2 or 3 alkyl groups, the total number of carbon atoms therein being 6 to 9, inclusive;



wherein W_1 and W_2 are as defined above, with the proviso that the —N=N—B group is in the 3- or 4-position of Ring D,

R is hydrogen, halo, methyl or sulfo,

Y is —OH or —NH_2, and

Z is methyl or carboxy,

wherein each halo is independently fluoro, chloro, bromo or iodo, with the provisos that (i) the disazo compound contains at least one water-solubilizing group and (ii) the metal complex may be in salt form only if the disazo compound contains at least one sulfo or carboxy group or if it is a 1:2 metal complex.

4,374,065

ANTIBACTERIAL AGENTS OF THE β-LACTAM TYPE

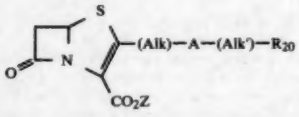
Marcel Menard, Candiac, and Alain Martel, Delson, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 77,886, Sep. 21, 1979, Pat. No. 4,282,150, which is a continuation-in-part of Ser. No. 968,663, Dec. 18, 1978, abandoned. This application Apr. 13, 1981, Ser. No. 254,551

Int. Cl.³ C07D *499/02;* **A61K** *31/425*

U.S. Cl. 260—245.2 R **6 Claims**

1. A compound having the formula



wherein Z is hydrogen or a conventional carboxyl protecting group; Alk represents a C_1–C_2 alkylene group optionally substituted by a C_1–C_4 alkyl radical; A is S, SO, SO_2 or NR_{21} in which R_{21} is hydrogen, (lower)alkyl, phenyl or phenyl(lower-)alkyl; Alk' is a C_2–C_4 alkylene group and R_{20} is —NHOH, —NO_2 or —$NR_{22}R_{23}$ in which R_{22} and R_{23} are each independently hydrogen or (lower)alkyl; or a pharmaceutically acceptable salt thereof.

4,374,066

METHOD FOR MAKING TRIARYLSULFONIUM SALTS

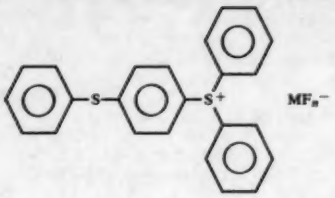
James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 79,692, Sep. 28, 1979. This application Oct. 27, 1980, Ser. No. 200,769

Int. Cl.³ C07F *9/68, 9/90, 5/02*

U.S. Cl. 260—440 **5 Claims**

1. A method for making triarylsulfonium salts of the formula,



which comprises,

(1) stirring a mixture of 4 moles of benzene per mole of sulfur monochloride in the presence of an effective amount of aluminum chloride at a temperature of between about 30°–35° C.,

(2) introducing chlorine into the mixture in an amount substantially equivalent to the moles of sulfur monochloride utilized in (1),

(3) combining the mixture of (2) with sufficient water to decompose the resulting complex,

(4) recovering the resulting triphenylsulfonium chloride from the mixture of (3),

(5) combining the recovered triphenylsulfonium chloride in the form of an aqueous mixture with an alkali metal or metalloid salt selected from the class consisting of potassium hexafluoroarsenate, potassium hexafluoroantimonate and sodium tetrafluoroborate and

(6) recovering the resulting triphenylsulfonium polyfluoro metal or metalloid salt from the mixture of (5), where M is a metal or metalloid selected from arsenic, antimony and boron, and n is an integer having a value of 4–6.

4,374,067

INTERMEDIATES FOR THE PREPARATION OF 4-PHENYL-1,3-BENZODIAZEPINS AND METHODS FOR PREPARING THE INTERMEDIATES

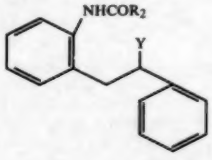
Thomas B. K. Lee, Whitehouse Station, and George E. Lee, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Dec. 23, 1981, Ser. No. 333,965

Int. Cl.³ C07C *143/68, 125/06, 103/127*

U.S. Cl. 260—456 A **8 Claims**

1. A compound of the formula



where Y is —OH; halogen;

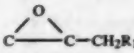
R_1SO_3—; where R_1 is a straight chain or branched chain alkyl group having 1 to 5 carbon atoms, or aryl; and R_2 is —$C(CH_3)_3$ or —$OC(CH_3)_3$.

4,374,068
PROCESS FOR HYDROXYALKYLATION OF CYANOETHYLANILINES

Edward W. Kluger, Pauline, and Jack L. Rolen, Inman, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 15, 1981, Ser. No. 311,661
Int. Cl.³ C07C *121/80*
U.S. Cl. 260—465 D 12 Claims

1. A process for hydroxyalkylation of cyanoethylanilines which comprises reacting an alkylene oxide of the formula:

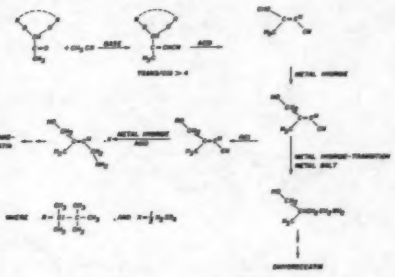


wherein R_1 is selected from H, Cl, Br, OH, a lower alkyl group containing from 1 to about 4 carbon atoms, or phenyl with a cyanoethylaniline in a molar ratio of from about 1:1 to about 2:1 in a reaction medium at a temperature of less than 100° C. in the presence of an acid catalyst provided in an amount sufficient to catalyze said reaction to thereby provide the corresponding hydroxyalkylated cyanoethylaniline.

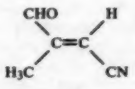
4,374,069
PROCESS FOR THE PREPARATION OF TRANS-3-FORMYLBUT-2-ENENITRILE

Shi-Chow Chen, Edmonton, and John M. MacTaggart, both of Edmonton, Canada, assignors to Alberta Research Council, Edmonton, Canada

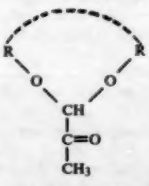
Division of Ser. No. 113,444, Jan. 21, 1980, Pat. No. 4,361,702.
This application Apr. 13, 1981, Ser. No. 253,319
Int. Cl.³ C07C *121/34*
U.S. Cl. 260—465.4 6 Claims



1. trans-3-Formylbut-2-enenitrile having the structure:



2. The process comprising:
reacting a pyruvaldehyde acetal having the general formula



where R is an alkyl, cycloalkyl, substituted alkyl, or alkenyl group having from about 1–10 carbon atoms, or part of a methylene chain in a cyclic acetal of a 5–10 membered ring structure, with acetonitrile in the presence of a strong base at an elevated temperature for a time sufficient to form an acetal of 3-formylbut-2-enenitrile; and
hydrolyzing the acetal of 3-formylbut-2-enenitrile in an acidic solution selected from the group consisting of an aqueous mineral acid, an aqueous strong organic acid, an aqueous mineral acid and a water miscible organic solvent, and an aqueous strong organic acid and a water miscible organic solvent, to form a product mixture containing trans-3-formylbut-2-enenitrile.

4,374,070
PREPARATION OF ACETIC ANHYDRIDE

Thomas H. Larkins; Stanley W. Polichnowski; Gerald C. Tustin, all of Kingsport, Tenn., and David A. Young, Baton Rouge, La., assignors to Eastman Kodak Company, Rochester, N.Y.

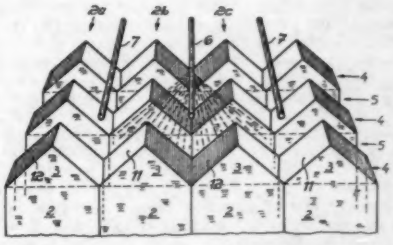
Filed Nov. 21, 1980, Ser. No. 209,350
Int. Cl.³ C07C *51/54*
U.S. Cl. 260—549 4 Claims

1. In a process for the preparation of acetic anhydride by the carbonylation of methyl acetate in the presence of rhodium and an iodine compound at elevated pressure and temperature, the improvement comprising the presence of about 2 to 7 volume percent hydrogen in the gas fed to the carbonylation reactor and the carbonylation is carried out in the presence of lithium.

4,374,071
COUNTERFLOW COOLING TOWER

Ulrich Regehr, 51 Aachen, Susterfeld 65, Fed. Rep. of Germany

Filed Aug. 12, 1981, Ser. No. 292,162
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030395; Aug. 12, 1980, 3030439
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—109 11 Claims



1. A counterflow cooling tower comprising a casing having cooling air inlet openings formed at its lower end and cooling air outlet openings formed at its upper end; a contact body positioned in said casing and formed from a plurality of contact layers arranged in banks and defining a plurality of water and air flow channels therebetween providing communication between said air inlet and outlet openings; means positioned above said contact body for supplying warm water to be cooled to said channels; channel caps on top of only some of said channels fitted geometrically to adjacent contact layers, said channel caps covering some of said channels against water from said means for supplying warm water; said means for supplying warm water comprising elongated spray nozzles installed in the areas between the channel caps and running at an angle to the channels over the extent of the banks; and means for supplying cooling air from said air inlet openings through substantially all of said channels to said air outlet openings, whereby the temperature and moisture-content of air supplied to the channels to which warm water is supplied are increased while the temperature of air supplied to the other

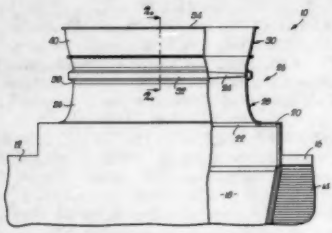
channels is increased by heat transfer through adjacent layers of the contact body without substantially changing the moisture-content thereof.

4,374,072

REFLEX FAN CYLINDER FOR WATER COOLING TOWERS

Samuel W. Bell, Jr., Shawnee Mission, Kans., assignor to Marley Company, Mission, Kans.

Filed Aug. 31, 1981, Ser. No. 298,086
Int. Cl.³ F04D *29/54*
U.S. Cl. 261—109 **6 Claims**



1. In a fan assembly for a water cooling tower having a fan blade rotatable about an upright axis, the combination with said blade of an upright, open-ended tubular body coaxial with the fan in surrounding relationship thereto and provided with a lower, generally cylindrical wall section aligned with and receiving the fan blade, said lower blade-receiving wall section having an effective height at least equal to the effective cross-sectional height of the area occupied by the fan blade during rotation thereof, said tubular body further being provided with a reflex recovery wall section joined to and extending upwardly from the lower blade-receiving wall section, said recovery wall section having a lower, tubular portion projecting upwardly from the blade-receiving wall section and diverging outwardly from the cylindrical blade-receiving wall section above the fan blade at a first angle relative to the blade-receiving wall section and thereby the axis of rotation of the fan blade, the recovery wall section being provided with a second tubular portion projecting upwardly from the lower tubular portion thereof and configured such that the second wall portion is at a second angle relative to the first portion which is a different angle relative to the axis of rotation than the angularity of the first tubular portion with respect to such axis, the angularity of the first wall portion with respect to said axis being greater than the angularity of the second wall portion to such axis, said first angle being from 15° to 30° and the second angle being up to about 10°.

4,374,073

METHOD OF MAKING A HEAT-SEALED PYROTECHNIC CAP

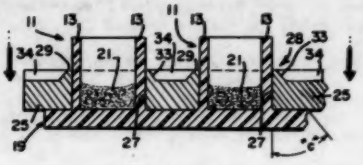
Harold H. Hall, Jr., Marblehead; Andre C. Bouchard, Peabody, both of Mass.; John W. Shaffer, and Thomas L. Gavenonis, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 2,263, Jan. 10, 1979, Pat. No. 4,267,774. This application Oct. 6, 1980, Ser. No. 194,709
Int. Cl.³ C06B *21/00*
U.S. Cl. 264—3 R **12 Claims**

1. A method of making a pyrotechnic cap for providing an audible signal of high intensity upon receipt of energy in the form of light and/or heat from a flashlamp; said method comprising:

providing a plastic container having in cross-section at least two side walls, said side walls defining an open end within said container;

depositing a quantity of pyrotechnic mixture within said container through said open end, said mixture occupying a predetermined level within said container; and



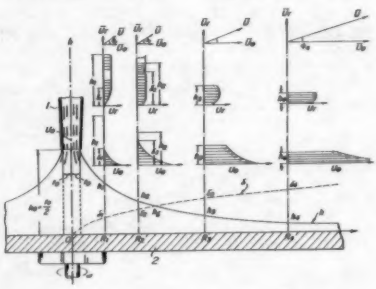
engaging said side walls with a heated first platen to form a heat-seal between said walls, said heat-seal hermetically sealing said open end.

4,374,074

PROCESS FOR PRODUCING FIBERS WITH A SPECIALLY FIXED SIZE FROM MELTS

Setsuo Ueda, Chigasaki; Takashi Yasuda, Aichi; Tokuyoshi Yamada, Nagoya, and Shigeki Kobayashi, Tokyo, all of Japan, assignors to Sato Technical Research Laboratory Ltd., Kanagawa and Itoh Metal Abrasive Co., Ltd., Aichi, both of, Japan

Continuation of Ser. No. 69,851, Aug. 27, 1979, Pat. No. 4,323,523. This application Oct. 31, 1980, Ser. No. 202,864
Claims priority, application Japan, Aug. 29, 1978, 53-104430
Int. Cl.³ B01J *2/14*
U.S. Cl. 264—8 **5 Claims**



1. A process for producing fibers with an analytically predetermined diameter from a melt comprising:

establishing a kinematic viscosity of the melt in a range of 0.001 to 10 cm^2/sec. by heating the melt at a temperature higher than its melting point, wherein said melt consists essentially of at least one material selected from the group consisting of metal, slag, flux and a mixture thereof;

introducing the melt through a conduit at a predetermined outflow velocity in a range of 5 to 500 cm/sec. onto the center of a rotating disk having a rotational speed in the range of 3,000 to 30,000 rpm and an effective disk diameter of 50–200 mm having a flat refractory surface;

locating said conduit having an outlet with a radius r_o of 3 to 30 mm so that the distance h_o between said conduit outlet and said disk surface is maintained within a range of $r_o/2$ to $r_o/2+2$ mm;

forming a film stream of said melt with a predetermined thickness, at least, in the proximity of the periphery of said disk surface by centrifugal force, said film stream being provided with a tangential velocity component as well as a radial velocity component throughout the entire thickness thereof, by selecting an effective diameter of the disk surface in a range of 50 to 200 mm;

projecting said film stream into a free space of air atmo-

sphere from the periphery of said disk by said centrifugal force resulting from the rotation of said disk;

splitting said film stream into free linear streams with a predetermined radius by sudden termination of said tangential velocity component and additional action of surface tension;

sucking a gas stream in a direction parallel and cocurrent to said linear streams of the melt, thereby lengthening the path of motion of said linear streams; and

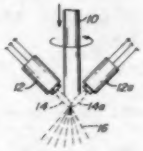
solidifying said free linear streams with cooling by temperature difference between said linear stream and the ambient atmosphere during space motion to produce fibers with an analytically predetermined diameter.

4,374,075

METHOD FOR THE PLASMA-ARC PRODUCTION OF METAL POWDER

Charles F. Yolton, Coraopolis, Pa.; Thomas S. Cleran, East Liverpool, Ohio, and Thomas W. Sloan, Calcutta, Ohio, assignors to Crucible Inc., Pittsburgh, Pa.

Filed Jun. 17, 1981, Ser. No. 274,604
Int. Cl.³ B01J *2/04*
U.S. Cl. 264—8 **9 Claims**



1. A method for making atomized metal particles, comprising:

(a) directing a plasma arc gas jet to contact a solid metal article to simultaneously heat, to melt, and to atomize said metal into droplets, and

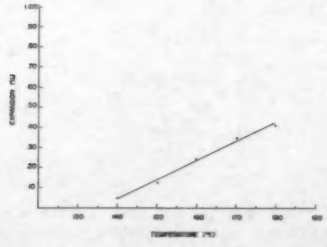
(b) cooling said metal droplets to solidification within an inert atmosphere to form said metal particles, while maintaining said droplets free from surface contact prior to solidification.

4,374,076

METHOD FOR MAKING CAST EPOXY RESIN BODIES AND EPOXY FORMULATION THEREFOR

James E. Stephan, Arvada; Paul A. Boduch, Lakewood, and John A. Elverum, Englewood, all of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Oct. 9, 1981, Ser. No. 310,170
Int. Cl.³ B29C *5/00*; A61C *13/08*
U.S. Cl. 264—19 **21 Claims**



1. A method for making a cast epoxy resin body to close shape tolerances, said method comprising:

forming a uniform mixture of Components A and Component B in a ratio of about from 20 to 50 parts by weight Component B to each 100 parts by weight Component A, Component A consisting essentially of from about 40 to 70% by weight epoxy novolac polymer, from about 30 to 50% by weight vinyl-3-cyclohexene diepoxide and from 0 to about 20% by weight 3,4 epoxy cyclohexylmethyl-3,4-epoxy cyclohexane carboxylate; and Component B consisting essentially of partially hydrolyzed aryl tetracarboxylic acid dianhydride.

casting said mixture in a mold, said mixture being allowed to remain in the mold until it cures to a solid body; and

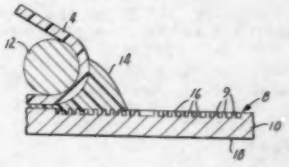
heating said solid body for a sufficient time and at a sufficient temperature to cause it to permanently expand at least sufficiently to compensate for the shrinkage of said body which occurred during the curing thereof in the mold.

4,374,077

PROCESS FOR MAKING INFORMATION CARRYING DISCS

Donald J. Kerfeld, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1980, Ser. No. 117,467
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—22 **14 Claims**



1. A method for making an information carrying disc or disc blank which comprises (1) moving a first layer relative to a second layer from a nonparallel to a parallel position so as to spread in the form of a bead, a photopolymerizable liquid mass between the two layers, one of said layers having a patterned surface facing the other layer with a circular, arc-like, or spiral pattern of depressions, protuberances, grooves with or without modulations or combinations of depressions, protuberances and grooves with or without modulations, the other of said layers having a surface to which the photopolymerizable liquid will bond upon polymerizing, (2) then irradiating said photopolymerizable liquid to polymerize said liquid and bond the polymer formed to the other of said layers, and then (3) removing said polymer and the layer to which it is bonded from said patterned surface.

4,374,078

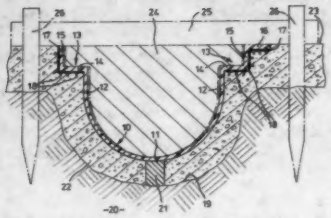
METHOD OF FORMING FLOOR DRAINAGE TROUGH INSTALLATION

John K. D. Richardson, 303 Nantucket Blvd., Scarborough, Ontario, Canada M1P 2P2

Filed Sep. 12, 1980, Ser. No. 186,626
Int. Cl.³ E04B *1/16*
U.S. Cl. 264—35 **8 Claims**

1. A method of forming a floor drainage trough installation comprising the steps of molding plastics material in a mold to form a deformable floor drainage trough comprising a bottom wall and upstanding side walls, with strips of fabric material having closely spaced resilient elements bein incorporated in the mold during the molding of the plastics material and being thereby coated with the plastics material, removing the trough from the mold before the plastics material has fully set and allowing said plastics material coated elements under the influence of the resiliency thereof to project outwardly from the upper edge portions of the side walls of the trough, fully setting the plastics material, positioning the trough in the desired

location, and pouring a body of cementitious material constituting a floor to set the drainage trough therein with the closely spaced elements of the fabric material being securely embedded in the body of cementitious material, shrinkage of the body of cementitious material during curing thereof causing deformation of the trough such that the upper edge portions of the side walls of the trough are splayed apart thereby substantially preventing gaps between said upper edge portions of the side walls of the trough and the body of cementitious material.

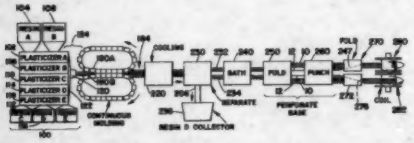


4,374,079

METHOD AND APPARATUS FOR MANUFACTURING EXPANDED AND LAYERED SEMIROUND PLASTIC TUBINGS

James L. Fouss; Larry A. Rosenbaum, and James L. Child, Jr., all of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Mar. 4, 1981, Ser. No. 240,602
Int. Cl.³ B29D *27/00;* **B29C** *17/07, 17/10*
U.S. Cl. 264—46.1 **34 Claims**



1. The method for concurrently manufacturing at least two hollow tubing structures, which tubing structures each comprise a top wall and a generally flat base which is at least partially integral with the top wall, the method comprising:

concurrently extruding at least a first pair of hollow sleeves formed at least partially of a first polymeric material;

advancing a strip of a material which is adhesively non-compatible with the first polymeric material between and contacting the hollow sleeves during extrusion of the hollow sleeves; and

separating the first and second hollow sleeves from the adhesively non-compatible strip.

4,374,080

METHOD AND APPARATUS FOR ENCAPSULATION CASTING

Jon M. Schroeder, Santa Clara, Calif., assignor to Indy Electronics, Inc., Manteca, Calif.

Filed Jan. 13, 1981, Ser. No. 224,659
Int. Cl.³ B29C *6/00, 6/02*
U.S. Cl. 264—102 **7 Claims**

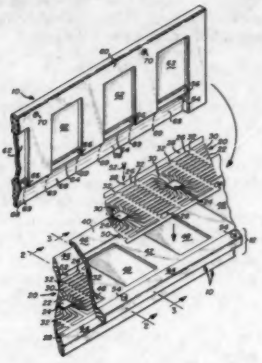
1. A method for encapsulation casting comprising the steps of:

a. securing an item to be encapsulated to a first surface of a split matrix molding cavity element and then mating a surface of another split matrix molding cavity element with said first surface to which said item is secured thereby forming a composite cavity about the matrix and with an orifice extending from the cavity to the exterior whereby a stack of mated matrix elements is established, said item being enclosed within the molding cavity established therein;

b. rigidly securing said stack of mated matrix elements;

c. filling said molding cavity in said rigidly secured stack with a quantity of particulate filler material;

d. evacuating said molding cavity containing said item to be encapsulated and said particulate filler material so as to remove gases and moisture;



e. filling said evacuated molding cavity with an encapsulating compound;

f. removing the source of vacuum, thus allowing atmospheric pressure to act on the encapsulating compound; and

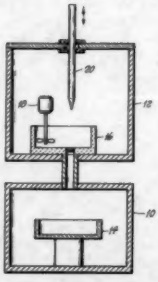
g. solidifying said encapsulating compound into an integral whole including said particulate filler material and encapsulating said item to be encapsulated.

4,374,081

CURE OF EPOXY SYSTEMS AT REDUCED PRESSURES

Arnold A. Hiltz, Swarthmore, and Francis L. Moy, Philadelphia, both of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Sep. 17, 1981, Ser. No. 303,078
Int. Cl.³ B29B *3/00;* **B29C** *6/00*
U.S. Cl. 264—102 **2 Claims**



2. A method of curing epoxide compounds used as encapsulants for fragile structures, said epoxide compounds from the group consisting of those which have been flexibilized with dimer acids and catalyzed with a heavy metal soap, and those which have been catalyzed with an amide comprising:

placing the mixed compound in a container;

reducing the ambient pressure to at least 4.99×10^3 Pa while

maintaining the ambient temperature at least 40° C. but no higher than 65° C. while mixing the compound;

pouring the mixed compound into a mold containing the part to be encapsulated while maintaining the vacuum and temperature; and

after at least 10 minutes, further reducing the ambient pressure to 4.79 Pa or lower and maintaining these conditions until the compound is cured.

4,374,082

METHOD FOR MAKING A PHARMACEUTICAL AND/OR NUTRITIONAL DOSAGE FORM

Richard Hochschild, 2915 Pebble Dr., Corona Del Mar, Calif. 92625

Filed Aug. 18, 1981, Ser. No. 293,782

Int. Cl.³ B28B *19/00*; B29B *1/02*

U.S. Cl. 264—129 **10 Claims**

1. A method other than tableting or encapsulating for making a dosage form suitable for oral administration, wherein lecithin, by way of the cohesive characteristics thereof, is utilized as a carrier or base by which active substances may be combined with the lecithin in a solid structure, said method comprising the steps of:

blending one or more active substances with the lecithin,

working the blend into a homogeneous mixture having a plastic consistency, and

shaping said mixture into one or more swallowable dosage units.

4,374,083

NUCLEAR REACTOR HAVING A LIQUID COOLANT

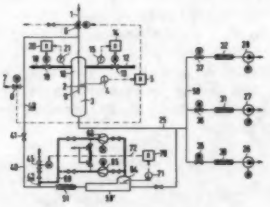
Hans Deinlein, Nuremberg, and Gottfried Kummer, Marloffstein, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jun. 26, 1979, Ser. No. 52,256

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1978, 2828153

Int. Cl.³ G21C *7/00*

U.S. Cl. 376—306 **9 Claims**



1. In a nuclear reactor with a primary loop and a liquid coolant loop connected to the primary loop, having a volume control surge tank for the coolant disposed in the liquid coolant loop, and a high pressure pump having a suction side and being disposed in the liquid coolant loop for feeding coolant taken from the primary loop back into the primary loop after purification, the improvement comprising a line bypassing the volume control surge tank and having an end connected to the suction side of the high-pressure pump, and means for introducing hydrogen gas into a liquid-filled section of the liquid coolant loop between the volume control surge tank and the suction side of the high-pressure pump.

4,374,084

ALLOY COMPOSITION SUITABLE FOR USE IN MAKING CASTINGS, AND A CASTING MADE THEREFROM

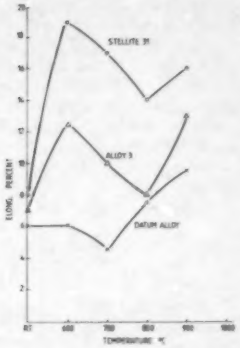
Geoffrey W. Meetham, Allestree, and John D. Gray, Newbold, both of England, assignors to Rolls-Royce Limited, London, England

Filed Apr. 1, 1981, Ser. No. 249,977

Claims priority, application United Kingdom, May 1, 1980, 8014554

Int. Cl.³ C22C *19/05*

U.S. Cl. 420—449 **4 Claims**



1. An alloy suitable for casting and consisting essentially of by weight percent:

Chromium	14.5–16.5%
Cobalt	9–11%
Molybdenum	5.5–8%
Aluminium	1.5–3%
Titanium	1.5–3%
Tantalum	0–1%
Niobium	0–1%
Boron	0.004–0.008%
Iron	0–0.5%
Manganese	0–0.4%
Silicon	0–0.2%
Nitrogen	0–0.5%
Carbon	0.11–0.18%

balance essentially Nickel apart from incidental impurities

4,374,085

SILVER-TIN-COPPER-PALLADIUM ALLOY AND AMALGAM THEREOF

Kamal Asgar, Ann Arbor, Mich., and Steven H. Reichman, New Hartford, N.Y., assignors to Special Metals Corporation, New Hartford, N.Y.

Filed May 29, 1980, Ser. No. 154,200

Int. Cl.³ C22C *9/00, 30/02*

U.S. Cl. 420—470 **20 Claims**

1. An amalgable dental alloy consisting essentially of, by weight, 30 to 70% silver, 15 to 37% tin, 0.05 to 0.95% palladium, up to 4% zinc, up to 6% indium, up to 5% manganese, up to 2% cadmium, up to 2% aluminum, up to 5% gallium, up to 2% ruthenium, up to 3% mercury, balance essentially copper; said alloy having at least 13% copper and no tin-mercury phase after trituration with mercury.

4,374,086

GOLD BASED MATERIAL FOR ELECTRICAL CONTACT MATERIALS

Jaydev D. Desai, Clifton Park, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,134
Int. Cl.³ C22C 5/02
U.S. Cl. 420—507 1 Claim

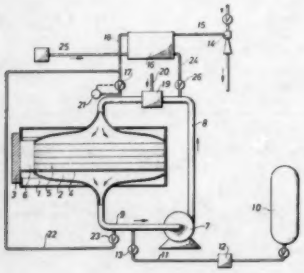
1. An electrical contact comprising, as a contact material, a gold based sintered powder compact consisting essentially of a high purity gold powder of at least 99.99 percent purity, and a high purity powder of a compound selected from a group consisting of WC, HfB_2, TiB_2, ZrB_2, WSi_2 and $TiSi_2$ and having a hexagonal crystaline structure, the compact having a 97 percent density, a hardness of approximately 58 DPH, and a resistivity of approximately 3 μohm-cm, and having been pressed by cold isostatic pressure of at least 50,000 psi and sintered at a first temperature of approximately 900° C. for approximately two hours followed by a second temperature of approximately 1,000° C. for two hours.

4,374,087

METHOD OF STERILIZING MATTRESSES, LAUNDRY SACKS AND SIMILAR ARTICLES IN A STERILIZING APPARATUS

Bengt O. Hallström, S-182 65, Djursholm, Sweden

Filed Jun. 17, 1981, Ser. No. 274,459
Int. Cl.³ A61L 9/00
U.S. Cl. 422—34 4 Claims



1. A method of sterilizing mattresses, laundry sacks and similar articles comprising:

(a) placing and sealing said articles in a sterilizing chamber of a sterilizing apparatus, said sealing being effected so as to leave no gap beside or between said articles;

(b) removing the air in said chamber and replacing the air with a sterilization gas;

(c) circulating said gas through the sterilizing chamber while heating and humidifying said gas;

(d) removing said gas from said chamber and replacing said gas with clean, filtered air which is heated during the period of its circulation through the sterilizing chamber; and

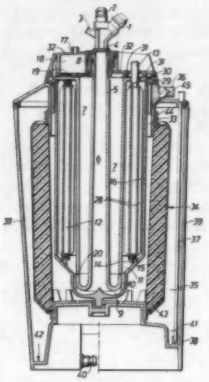
(e) drawing clean air into said chamber and discharging of the sterilized articles.

4,374,088

APPARATUS FOR THE TRANSFER OF ONE OR MORE SUBSTANCES BETWEEN A GAS AND A LIQUID

Kaj O. Stenberg, Staffanstorp; Lars J. C. Traven, Lund; Ingvar F. Losell, Staffanstorp, and Bo A. Johnsson, Landskrona, all of Sweden, assignors to Gambro Heart-Lung Products AB, Sweden

PCT No. PCT/SE80/00096, § 371 Date Oct. 22, 1981, § 102(e) Date Oct. 22, 1981, PCT Pub. No. WO81/02836, PCT Pub. Date Oct. 15, 1981
PCT Filed Apr. 3, 1980, Ser. No. 314,831
Int. Cl.³ A61M 1/03
U.S. Cl. 422—46 27 Claims



1. Apparatus for the transfer of one or more substances between a gas and a liquid, said apparatus comprising:

liquid conduction means defining a flow path for a liquid, said liquid conduction means including means defining a vertically arranged, narrow annular gap in said flow path, said annular gap having a dimension thereacross which is less than the dimension across said flow path upstream and downstream of said narrow annular gap;

gas introduction means for introducing a gas in the form of bubbles into said liquid as said liquid is conducted along said flow path to thereby effect transfer of substances between said gas and said liquid, said gas introduction means being arranged about the periphery of said narrow annular gap so as to uniformly introduce gas bubbles along the entire periphery of said annular gap into said liquid as said liquid is conducted through said narrow annular gap; and

removal means along said flow path downstream of said narrow annular gap for removing excess gas from said liquid together with any substances transferred from said liquid to said gas.

4,374,089

CHROMATOGRAPHIC ACCESSORY INCORPORATING INJECTION SWITCH ASSEMBLY

Kumiy R. Iwao, Lafayette, and James V. Lovie, Chester, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 154,188, May 29, 1980, abandoned.
This application Jan. 21, 1982, Ser. No. 341,396
Int. Cl.³ G01N 1/18, 31/06; B01L 11/00
U.S. Cl. 422—70 2 Claims

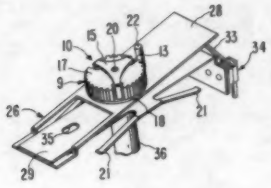
1. A chromatographic assembly comprising in combination:

a chromatographic column;

a nut having an axial bore therethrough for accommodating the needle of a sample syringe, said nut having at least three indentations on the exterior thereof which are parallel to said axial bore and which are positioned in equally spaced apart positions around the circumference of said exterior of

said nut, said nut being attached to the end of said chromatographic column;

a sheath-like moveable member which is fit around the exterior of said nut, and slides over said nut in the axial direction, the sheath-like moveable member being structured and positioned such that it is prevented from rotational movement with respect to said nut by riding in said at least three identations, said sheath-like moveable member being able to travel between a ready position wherein said sheath-like moveable member has a portion thereof extending above the upper surface of said nut and a depressed position wherein said sheath-like moveable member has been depressed with respect to said upper surface of said nut, said sheath-like moveable member having an opening in its upper surface concentric with said axial bore through said nut to permit the passage of said needle therethrough;



a microswitch electrically connected to monitoring or detection equipment for monitoring or detecting sample separation in said chromatograph column, said microswitch being positioned so as to be contacted by said moveable member when it reaches said depressed position; and

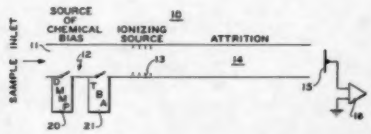
bias means engaging the bottom of said moveable member to thereby place said moveable member under tension whereby said moveable member is biased towards said ready position and whereby the depression of said moveable member by said sample syringe works against said tension produced by said bias means and forces said moveable member to contact said microswitch to initiate operation of said monitoring or detection equipment.

4,374,090

CHEMICAL BIAS AGENT DETECTION

B. Thompson McClure, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 6, 1981, Ser. No. 280,438
Int. Cl.³ G01N *27/66, 27/70*
U.S. Cl. 422—98 **5 Claims**



1. An ionization type chemical agent detector with a chemical bias comprising:

a housing having an inlet and an outlet for passage of gas samples;

means defining a source of a chemical bias agent selected from the group consisting of dimethylmethyl phosphonate, dissopropylmethyl phosphonate, di-N-butylamine, tributylamine and dimethyl sulfoxide connected to the housing to add said bias chemical to the incoming gas samples;

means defining a source of ionization mounted in the housing to ionize said incoming gas samples;

means defining an attrition region in said housing downstream from said source of ionization;

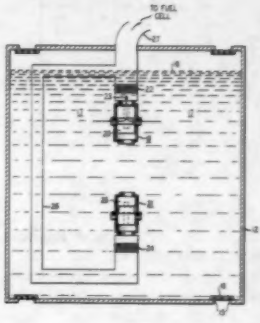
and a collector electrode mounted near said housing outlet for generating an electric signal which is a function of ions present in the gas sample after passing through said attrition region.

4,374,091

GAS GENERATORS HAVING CONTROLLED OPERATIONAL ATTITUDES

Edward H. Reiss, Jr., Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1981, Ser. No. 293,415
Int. Cl.³ G05D *7/00;* **B01J** *7/00, 4/00*
U.S. Cl. 422—114 **6 Claims**



1. Apparatus for producing a gas comprising:

a storage chamber;

a first liquid chemical means contained in said storage chamber for aiding in the production of a desired gas;

valve means operatively connected to said storage chamber including means sensitive to the orientation of said valve with respect to the gravitational field in which it is placed for allowing said first liquid chemical means to pass through said valve means only when said gravitational sensing means indicates a desired range of orientation with respect to said gravitational field;

a reaction chamber connected to said valve means at the outflow end thereof; and,

a second chemical means contained in said reaction chamber for reacting with said first chemical means to produce said desired gas.

4,374,092

SYSTEM FOR ELECTRICALLY HEATING AND REGENERATING SPENT ACTIVATED CARBON

Gerald E. Marquess, 100 Hudson St., New York, N.Y. 10013, and David J. Nell, Lotus Ave., Oradell, N.J. 07649

Filed Jul. 9, 1981, Ser. No. 281,691
Int. Cl.³ B01J *4/00, 8/12, 20/34*
U.S. Cl. 422—199 **2 Claims**

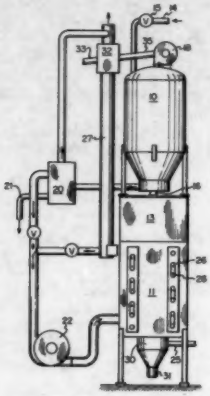
1. A system for reactivating a spent activated carbon material and the like comprising solid-liquid separator, a surge bin for receiving the output of the separator, a continuous feed electrically heated furnace for receiving material from the surge bin,

said solid-liquid separator comprising means for passing fluids and retaining solid materials, means for gating the material to said surge bin,

said surge bin arranged to receive the output of said solid-liquid separator and to continuously feed it to the electrically heated furnace,

said electrically heated furnace being an elongate column with baffles therein for channeling the flow of carbon

material centrally of the column through which the material flows, electrical resistance heating elements outside the flow of carbon material and positioned near the walls and inside of the furnace for radiation and convection heating of said material, controllable means for discharging materials at the bottom of the furnace, said furnace



having an exhaust outlet near its upper end and a treatment gas inlet near its lower end,

whereby the amount of energy required for reactivation of the spent activated carbon material is reduced and the amount of loss due to abrasion and excessive oxidation is also reduced.

4,374,093

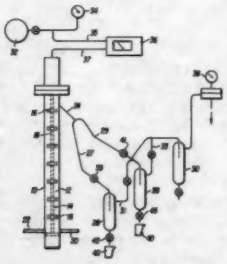
CONTINUOUS-STREAM UPFLOW ZEOLITE CRYSTALLIZATION APPARATUS

Louis D. Rollmann, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 236,090, Feb. 20, 1981, abandoned, which is a continuation of Ser. No. 47,536, Jun. 11, 1979, abandoned. This application Aug. 26, 1981, Ser. No. 296,600

Int. Cl.³ B01D *9/02*

U.S. Cl. 422—202 **11 Claims**



1. An apparatus for preparing crystalline zeolite materials on a continuous stream basis comprising

a substantially vertically-oriented reactor means,

a stirring means inside said reactor means, said stirring means being operatively associated with said reactor means and comprising an elongated rod means having a plurality of blades angularly disposed about said rod means,

said stirring means extending substantially throughout the entire length of said reactor means,

a first and a second reactants entrance means in the lower portion of said reactor means,

said first reactants entrance means being positioned on the opposite side of said reactor means than said second reactants entrance means,

said first reactants entrance means continuously conveying a source of silica into said reactor means,

said second reactants entrance means continuously conveying a source of alumina ions into said reactor means,

at least one product exit means in the upper portion of said reactor means for continuously removing crystalline zeolite product from said reactor means,

a multitude of baffle means on the inside surface of said reactor means, said baffle means being disposed angularly with respect to said inside surface of said reactor means and being spaced in such a manner that said baffle means are interspaced in-between said blades of said stirring means,

said angularly disposed blades, said baffle means and said first and second reactants entrance means positioned on the opposite sides of said reactor means cooperating in advancing the reactants upwardly and preventing plugging of the first and second reactants entrance means by the crystalline zeolite materials,

a heating means surrounding said reactor means, and

a pressurizing means for pressurizing said reactor means with an inert gas.

4,374,094

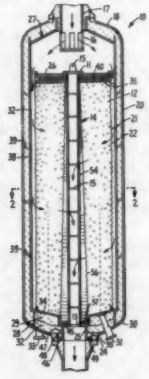
METHOD AND APPARATUS FOR UNIFORM FLOW THROUGH RADIAL REACTOR CENTERPIPES

Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 29, 1981, Ser. No. 316,522

Int. Cl.³ B01J *8/02, 35/02*

U.S. Cl. 422—218 **7 Claims**



1. A method of preventing longitudinal displacement of the centerpipe of a radial flow catalytic reactor vessel due to thermal cycling of fluids flowing therethrough and differences in thermal expansion of said centerpipe with uniform permeability of radial flow for reactant fluids through the catalyst bed along the length of said centerpipe which comprises

positioning a centerpipe centralizing socket member in the lower end wall of said vessel, seating a centerpipe in said socket member sufficiently deep to maintain said centerpipe in a vertical position extending axially parallel to a substantial portion of the sidewall of said vessel,

said centerpipe being formed throughout its length as a screen member having frustoconical shape whose diame-

ter decreases from said socket member toward the upper end wall of said vessel, said screen member having uniformly spaced openings throughout its circumferential surface over said length,

enclosing said screen member of said centerpipe within a generally cylindrical body of catalyst particles extending radially outward from said centerpipe to a location adjacent to said vessel sidewall, and

forming vertical passageways between said sidewall of said vessel and said body of catalyst particles to permit radial flow of reactant fluids through said body between said wall and said centerpipe so that the permeability to fluid flow across said body of such radial flow is substantially uniform throughout the length of said frustoconical centerpipe and thermal cycling is resisted by the gravity component of said cylindrical catalyst bed along the length of said frustoconical centerpipe.

2. In a radial flow reactor vessel having inlet and outlet passageways, means for retaining a generally cylindrical bed of catalyst particles extending through said reactor and so arranged as to permit radial fluid flow between the center of said bed and the peripheral area of said cylindrical bed, a perforated centerpipe member extending through said catalyst bed, said reactor having a sealable access opening in the upper end of said vessel for installation and removal of said catalyst particles, said perforated centerpipe member, and said retaining means, the improvement comprising

a centerpipe seat member mounted at the lower end of said vessel in fluid communication with said outlet passageway,

a centerpipe having one end formed to frictionally engage said seat member for support thereof coaxially with said reactor vessel, and having a diameter which is tapered inwardly from said seat end to the other end thereof to increase the radial distance for fluid flow through said cylindrical catalyst bed from said one end to said other end of said centerpipe,

a catalyst engaging surface of said centerpipe being formed as a tapered screen member having substantially uniform permeability to fluid flow throughout the length of said centerpipe from said seat and to the enclosed upper end thereof.

4,374,095

METHOD AND APPARATUS FOR RESTRAINING RADIAL FLOW CATALYTIC REACTOR CENTERPIPES

Douglas J. Legg, Portola Valley, and Ben G. Burke, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 29, 1981, Ser. No. 316,547
Int. Cl.³ B01J *8/02, 35/02*
U.S. Cl. 422—218 **6 Claims**

1. A method of preventing longitudinal displacement of the centerpipe of a radial flow catalytic reactor vessel due to thermal cycling of fluids flowing therethrough and differences in thermal expansion of said centerpipe and for increasing the volume thereof for increasing radial flow of reactant fluids through the catalyst bed along the length of said centerpipe which comprises

positioning a centerpipe centralizing socket member in the lower end wall of said vessel,

seating a centerpipe in said socket member extending axially parallel to a substantial portion of the sidewall of said vessel,

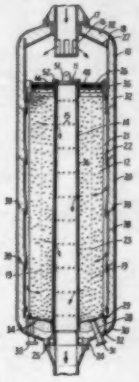
said centerpipe being formed throughout its length as a frustoconical section whose diameter decreases from said socket member toward the upper end wall of said vessel and having a plurality of spaced openings throughout said length,

covering at least said openings of said centerpipe with screen,

enclosing said centerpipe within a generally cylindrical body of catalyst particles extending radially outward from said centerpipe adjacent to said vessel sidewall, and

forming vertical passageways between said sidewall of said vessel and said body of catalyst particles to permit radial flow of reactant fluids through said body between said sidewall and said centerpipe, whereby increasing fluid flow into said centerpipe from across said body by radial flow therethrough is accommodated along the length of said frustoconical centerpipe and thermal cycling is resisted by the gravity component of said cylindrical catalyst bed along the surface of said frustoconical centerpipe.

2. In a radial flow reactor vessel having inlet and outlet passageways, means for retaining a generally cylindrical bed of catalyst particles extending through said reactor and so arranged as to permit radial fluid flow between the peripheral area of said cylindrical bed and the center of said bed, a perfo-



rated centerpipe member extending through said catalyst bed, said reactor having a sealable across opening in the upper end of said vessel for installation and removal of said catalyst particles, said perforated centerpipe member, and said retaining means, the improvement comprising

a centerpipe seat member mounted at the lower end of said vessel,

said centerpipe having one end formed to engage said seat member for support thereof and the diameter of said centerpipe being tapered inwardly from above said seat to the other end thereof;

screen means surrounding said centerpipe adapted to prevent catalyst particles from passing through the perforations in said centerpipe and means covering at least a portion of the upper end of said centerpipe to maintain the perforations of said centerpipe within said cylindrical bed of said catalyst particles.

4,374,096

URANIUM ORE PROCESSING

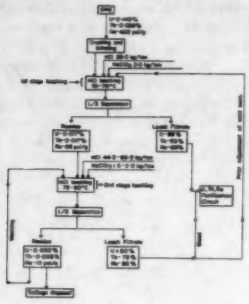
James M. Skeaff; Gordon M. Ritcey; Kazi E. Haque, all of Ottawa, and Bernard H. Lucas, Nepean, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Aug. 1, 1979, Ser. No. 62,801
Int. Cl.³ C01G *43/00;* **C01F** *15/00;* **C01G** *28/00, 49/00*
U.S. Cl. 423—9 **17 Claims**

1. A method of recovering separately uranium, thorium, and radium, from solids comprising ores, concentrates, calcines or tailings containing these metals, comprising:

(1) leaching in at least one stage, said U, Th and Ra-bearing solids in finely divided form with aqueous acidic leachant containing at least one of HCl and Cl_2, the leach conditions and stages being selected to cause high proportions of the uranium, thorium and radium to be dissolved;

(2) separating the aqueous leach solution from the solid residue and disposing of the residue;
(3) recovering uranium from the solution by solvent extraction and precipitation steps;
(4) when economic, recovering thorium from the solution by solvent extraction and precipitation;



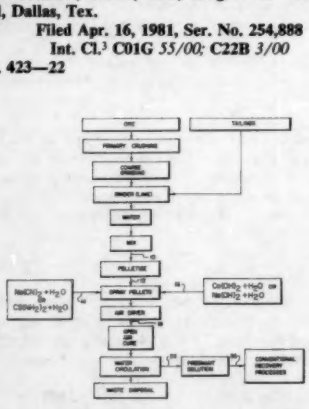
(5) recovering radium from the solution by at least one of ion exchange, adsorption, and precipitation, and disposing of the radium;
(6) when iron is present in the leach solution controlling the amount of iron in the solution to avoid any iron build-up therein, and
(7) recycling the resulting depleted chloride solution to step (1).

4,374,097

METHOD FOR RECOVERING PRECIOUS METALS

Larry D. Holland, Dallas, Tex., assignor to NEHA International, Dallas, Tex.

Filed Apr. 16, 1981, Ser. No. 254,888
Int. Cl.³ C01G *55/00*; C22B *3/00*
U.S. Cl. 423—22 **2 Claims**



1. A method for recovering precious metal values from ores comprising the steps:
producing a paste of particulated ore and a binding agent;
extruding the paste to form pellets;
coating the pellets with a lixiviant solution;
drying the lixiviant coated pellets; and,
spraying the dried pellets with water to yield a pregnant solution of a precious metal salt.

4,374,098

METHOD OF CONCENTRATING SILVER FROM ANODE SLIME

Toshimasa Iio, and Toyokazu Ohkubo, both of Niihama, Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,986
Claims priority, application Japan, Jun. 22, 1981, 56-96215
Int. Cl.³ C01G *21/20*
U.S. Cl. 423—27 **4 Claims**

1. A method of concentrating the silver in an intermediate product obtained by the treatment of anode slime generated during electrolytic copper refining, the intermediate product containing lead in sulfate form and silver in chloride form, the method comprising:
(a) reacting the intermediate product with an aqueous solution containing a compound selected from the group consisting of alkali metal hydroxides and carbonates wherein the amount of alkali metal added is in at least the stoichiometric amount up to 1.2 times the stoichiometric amount with respect to lead to form a reaction product;
(b) subjecting the reaction product obtained in step (a) to solid-liquid separation; and
(c) reacting the residue obtained in step (b) with a nitric acid solution, whereby the lead therein is separated into a filtrate, while the silver remains in the residue.

4,374,099

RECOVERY OF TUNGSTEN VALUES FROM ALKALI TUNGSTATE SOLUTIONS BY SOLVENT EXTRACTION

Tai K. Kim; Martin B. MacInnis, both of Towanda; Robert P. McClintic, and Martin C. Vogt, both of Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,377
Int. Cl.³ C01G *41/00*
U.S. Cl. 423—54 **2 Claims**

1. A process for producing ammonium tungstate from an aqueous alkali metal tungstate solution containing impurities comprising the steps of: (a) extracting said tungsten values into an organic extractant by contacting said aqueous alkali metal tungstate solution with said organic extractant for a sufficient period of time to form a loaded organic extractant containing tungsten values and an aqueous solution, said organic extractant consisting essentially of from about 6 to about 10 percent by volume of a mixture of tri-alkyl amines having alkyl chains of about 6 to 10 carbon atoms with trisooctyl amine being the major component in said mixture and from 90 to 94 percent by volume of an aromatic solvent consisting essentially of a mixture of alkyl benzenes wherein the alkyl benzenes constituting the mixture of alkyl benzenes have molecular weights of 120, 134, 148 and the total number of atoms in the alkyl chains attached to the benzene ring are either 3, 4, or 5; (b) separating said loaded organic extractant from said aqueous solution containing a portion of said impurities; (c) stripping said loaded organic extractant from step (b) by contacting with an aqueous ammonia solution at a volume ratio of said aqueous ammonia to said loaded organic extractant of from about 7 to one to about 3.5 to one to form an aqueous ammonium tungstate solution and a stripped organic extractant, said aqueous ammonia solution consist essentially of water and from 5 to about 21 percent by weight ammonium hydroxide at a pH of from about 12 to about 13, said contacting being carried out by dispersing said aqueous ammonia solution in said loaded organic extractant whereby a dispersed aqueous phase is formed in an organic continuous phase of organic extractant, (d) separating said aqueous ammonium tungstate from said stripped organic extractant; and (e) feeding a portion of said stripped organic extractant to step (a) for use as said organic extractant and feeding another portion of said stripped organic extractant to step (c) as organic phase for maintaining said volume ratio.

4,374,100

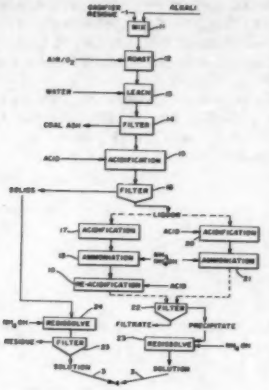
RECOVERY AND RECYCLE OF MOLYBDENUM VALUES FROM COAL LIQUEFACTION RESIDUE

Roger F. Sebenik; Calvin J. Hallada; Henry F. Barry, and George A. Tsigdinos, all of Ann Arbor, Mich., assignors to Amax Inc., Greenwich, Conn.

Continuation of Ser. No. 243,157, Mar. 18, 1981, abandoned. This application Jun. 30, 1982, Ser. No. 393,987

Int. Cl.³ C01G 39/00

U.S. Cl. 423—56 13 Claims



1. A process for treating a solid, glassy coal liquefaction residue containing molybdenum values entrapped therein, to recover molybdenum values therefrom, comprising

(a) intimately mixing the residue with an amount of alkali equivalent to about 6 to about 10 times the stoichiometric amount required for conversion of the molybdenum in the residue to water-soluble molybdate,

(b) roasting the mixture produced in step (a) under conditions which are oxidizing as to the molybdenum, to convert molybdenum in the residue to water-soluble molybdate,

(c) leaching the roasted product of step (b) with water to form a leach liquor containing molybdenum values dissolved therein and having a pH value above about 10.5,

(d) then filtering the leach liquor from the leach residue,

(e) lowering the pH value of the filtered leach liquor to a value between about 6 and about 10.5 to precipitate impurities and a minor portion of the molybdenum values, and to form a purified leach liquor,

(f) separating the precipitate from the purified leach liquor, whereby the precipitate can be treated to separate impurities from the molybdenum values,

(g) acidifying and then ammoniating the purified leach liquor from step (f) to precipitate an ammonium-polymolybdate complex, and

(h) recovering said ammonium-polymolybdate complex from the purified leach liquor.

4,374,101

CHEMICAL DISSOLUTION OF SCALE FORMED DURING PRESSURE LEACHING OF NICKELIFEROUS OXIDE AND SILICATE ORES

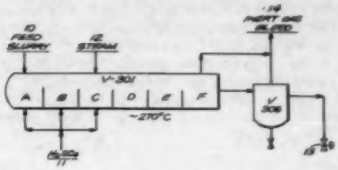
Guy W. Lussiez, Golden, and Mahesh C. Jha, Arvada, both of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jun. 21, 1982, Ser. No. 390,441

Int. Cl.³ C01G 53/00; C23F 14/02

U.S. Cl. 423—150 4 Claims

1. In a method for the sulfuric acid leaching of nickeliferous oxide and silicate ore, containing in addition to nickel, oxides and silicates of aluminum, iron and magnesium, wherein during high pressure leaching of nickeliferous oxide feed material in an autoclave at a temperature in the range of about 180° C. to 300° C., there is a tendency for the formation of scale on autoclave surfaces, the scale containing oxides and sulfates of metals selected from the group consisting of aluminum, silicon, iron and magnesium, the improvement which comprises,



flushing said autoclave following completion of a leaching regime with a sulfuric acid solution containing about 20 to 100 gpl H_2SO_4 at a temperature of about 150° C. to 250° C. and a pressure ranging from about 54 psig to 562 psig for a time at least sufficient to effect substantial removal of said scale.

4,374,102

POLYMERS FOR CONTROLLING SODA ASH CRYSTAL FORMATION

Lawrence J. Connelly, Oak Lawn, Ill.; James Kane, Sandy, Utah, and R. James Shields, Warrenville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 13, 1981, Ser. No. 321,288

Int. Cl.³ C01D 7/00, 7/40

U.S. Cl. 423—206 T 5 Claims

1. An improved process for crystallizing clarified aqueous trona solutions which comprises adding to these solutions prior to crystallization at least 3 ppm of a poly N,N-dimethylaminomethyl acrylamide.

4,374,103

METHOD OF USING A LOW COST CATALYST SYSTEM

Haren S. Gandhi, Farmington Hills, and Karen M. Adams, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 20, 1981, Ser. No. 284,762

Int. Cl.³ B01D 53/36

U.S. Cl. 423—213.5 17 Claims

1. In a process for treatment of exhaust gases from an internal combustion engine, the steps of:

burning a hydrocarbon fuel or a fuel containing hydrocarbons and alcohol blends in the internal combustion engine thereby to generate exhaust gases from the internal combustion engine containing various amounts of unburned hydrocarbons, carbon monoxide and oxides of nitrogen depending upon operating conditions of the internal combustion engine; and

passing said generated exhaust gases over an improved catalyst comprising:

a support medium for supporting a catalyst system, said support medium having both an upstream support portion over which exhaust gases initially flow and a downstream

support portion over which exhaust gases flow after passing over said upstream support portion thereof;

palladium on said upstream support portion;

palladium on said downstream support portion; and

finely divided tungsten on said downstream support portion, said tungsten being present on said downstream support portion in quantities that tungsten is available to substantially of said palladium on said downstream support portion so that said palladium/tungsten combination is effective in the catalytic oxidation of unburned hydrocarbons and carbon monoxide and the catalytic reduction of oxides of nitrogen without significant production of ammonia when the internal combustion engine is operating under fuel rich conditions.

4,374,104
COMPOSITION AND METHOD FOR REMOVING HYDROGEN SULFIDE FROM GAS STREAM

Harold S. Primack, Skokie, Ill., assignor to Air Resources, Inc., Palatine, Ill.

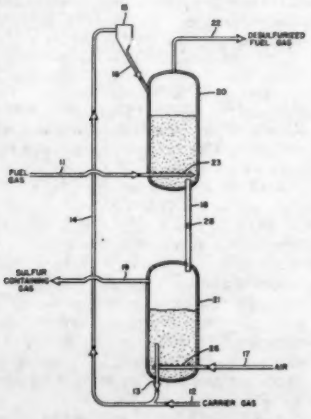
Filed Sep. 30, 1980, Ser. No. 192,559
Int. Cl.³ C01B *17/04*
U.S. Cl. 423—226 **25 Claims**

1. A catalytic oxidation-reduction composition for oxidizing hydrogen sulfide to form elemental sulfur in an aqueous alkaline reaction solution comprising an aqueous solution containing a chelated water soluble polyvalent metal catalyst having the metal in its higher valence state and containing at least one water soluble surfactant stable in said alkaline solution which is adapted to wet said elemental sulfur formed in said reaction solution and effect settling sulfur from said solution, and said surfactant being present in the aqueous solution in an amount sufficient to prevent the formation of a layer of sulfur froth on the surface of said reaction solution while maintaining the sulfur concentration in said reaction solution between about 0.1 wt. % and 10 wt. %.

4,374,105
PURIFICATION OF FUEL GASES

Gerald L. Anderson, Romeoville; Harley A. Borders, Berwyn, and Maria R. Aquino, Lockport, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Dec. 11, 1979, Ser. No. 102,339
Int. Cl.³ B01D *53/36*
U.S. Cl. 423—230 **19 Claims**

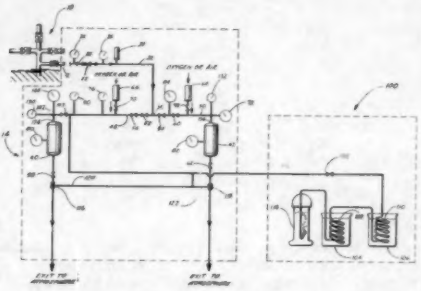


1. A process for substantial removal of ammonia from reducing gas streams comprising: contacting said reducing gas stream with solid zinc oxide (ZnO) in a reaction zone at temperatures of about 400° to about 1400° F.; decomposing said ammonia in said reducing gas in contact with said solid zinc oxide producing an equilibrium mixture of ammonia, hydrogen and nitrogen.

4,374,106
PROCESS FOR REDUCING THE HYDROGEN SULFIDE CONTENT IN GEOTHERMAL STEAM

Ann B. Tipton, Diamond Bar, and Alan C. Crosby, Tustin, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation of Ser. No. 294,631, Aug. 20, 1981, abandoned.
This application Apr. 30, 1982, Ser. No. 373,317
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—231 **17 Claims**



1. A process for removing hydrogen sulfide from geothermal steam comprising the steps of:

introducing an oxygen-containing gas into steam produced by a geothermal source, said steam comprising water vapor and hydrogen sulfide and having a temperature of at least about 300° F.; said oxygen-containing gas being introduced into said steam in an amount to provide a molar ratio of oxygen-to-hydrogen sulfide in the steam and oxygen-containing gas to be at least about 10; and,

contacting the steam and oxygen containing gas in a contacting stage with iron oxide supported by a carrier resistant to deterioration by said steam under conditions sufficient to remove hydrogen sulfide from said steam and oxygen containing gas.

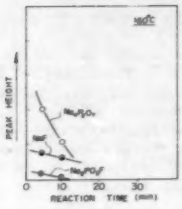
4,374,107
METHOD FOR DRYING ISOCYANIC ACID

Steven L. Trenbeath, Fairfield; Robert W. Novak, Stamford, and Allan M. Feldman, Norwalk, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 23, 1981, Ser. No. 304,758
Int. Cl.³ C01C *3/00, 3/14*
U.S. Cl. 423—265 **12 Claims**

1. A process for removing water from wet isocyanic acid which comprises forming a solution of isocyanic acid containing water in an organic solvent therefor, and adding to said solution a drying agent selected from the group consisting of hydrogen halides and compounds which form a hydrogen halide in said solution, said drying agent being added in an amount sufficient to provide said hydrogen halide in molar excess of the water present.

4,374,108
PROCESS OF PREPARING ALKALI MONOFLUOROPHOSPHATE
Yasuji Nakaso; Kyoji Tanaka, both of Ube, and Hiromi Kawamoto, Onoda, all of Japan, assignors to Central Glass Company, Limited, Yamaguchi, Japan
Filed Nov. 20, 1980, Ser. No. 208,685
Claims priority, application Japan, Nov. 22, 1979, 54-150757
Int. Cl.³ C01B 25/10
U.S. Cl. 423—301 6 Claims



1. A process for the preparation of an alkali monofluorophosphate expressed by the formula M_2PO_3F, where M represents Na or K, by a process comprising reacting hydrogen fluoride gas with an alkali phosphate selected from the group consisting of sodium pyrophosphate, potassium pyrophosphate, disodium hydrogenphosphate and dipotassium hydrogenphosphate, the steps of the process comprising: placing said alkali phosphate in a finely divided solid form in a reaction vessel and contacting with the hydrogen fluoride gas by continuously flowing the hydrogen fluoride gas into and through said vessel until the total quantity of hydrogen fluoride gas flowed into said vessel amounts to 100 to 150% of the theoretical value for conversion of said alkali phosphate to M_2PO_3F, while maintaining the temperature of the reaction in the range of from about 200° C. to about 450° C.

4,374,109
MANUFACTURE OF PHOSPHOSIDERITE IRON PHOSPHATE
Ferdinand A. Ruszala; James T. Hoggins, both of Columbus, and Stephen S. Hupp, Dublin, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.
Filed Dec. 17, 1981, Ser. No. 331,945
Int. Cl.³ C01B 15/16, 25/26
U.S. Cl. 423—311 4 Claims

1. A method for preparing phosphosiderite ($FePO_4.2H_2O$) comprising treating a Malten mixture of $Fe(NO_3)_3.9H_2O$ and H_3PO_4 with a phosphosiderite seed material at a temperature in the range of from 75° to 200° C. for a period of time thus causing the precipitation of phosphosiderite product and recovering the product.

4,374,110
PURIFICATION OF SILICON SOURCE MATERIALS
Robert D. Darnell, and William M. Ingle, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 15, 1981, Ser. No. 273,519
Int. Cl.³ C01B 33/107
U.S. Cl. 423—342 4 Claims

1. A process for removing BCl_3 and/or PCl_3 impurities from a silicon source material including trichlorosilane which comprises the steps of:

heating said material in gaseous form to a temperature of about 170° C. to about 300° C. with oxygen to effect formation of boron and/or phosphorous containing siloxane complexes; and

distilling to remove said siloxane complexes from said source material.

4,374,111
PRODUCTION OF SILANE
Philip A. Lefrancois, Cranford, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Nov. 21, 1980, Ser. No. 208,978
Int. Cl.³ C01B 33/04
U.S. Cl. 423—347 13 Claims

1. A process which comprises reacting a silicon halide with an agitated slurry of an alkali metal hydride in a liquid comprising at least about 50% by weight of a diaryl ether at a temperature between about 225° C. and the boiling point of the diaryl ether at the reaction pressure to effect formation of silane and the corresponding alkali metal halide.

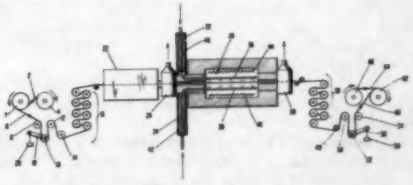
4,374,112
STABLE NF_4^+ SALT OF HIGH FLUORINE CONTENT
Karl O. Christe, Calabasas, and William W. Wilson, Canoga Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 22, 1980, Ser. No. 219,056
Int. Cl.³ C01B 21/00; C01G 45/00
U.S. Cl. 423—351 1 Claim

1. The salt having the formula: $(NF_4)_2MnF_6$, and characterized by having good thermal stability in storage.

4,374,113
PRODUCTION OF HIGH SURFACE AREA CARBON BLACKS
Barrie J. Yates, Andover, Mass., and Ronald C. Hurst, Pampa, Tex., assignors to Cabot Corporation, Boston, Mass.
Division of Ser. No. 62,727, Aug. 1, 1979, Pat. No. 4,283,378.
This application Apr. 30, 1981, Ser. No. 259,079
Int. Cl.³ C01B 31/00, 31/02
U.S. Cl. 423—445 11 Claims

1. A furnace-type carbon black product characterized by having an iodine surface area of at least 600 m^2/g, a pH value of less than 5 and a DBP value of at least 160 cc/100 g.

4,374,114
PROCESS FOR THE SURFACE MODIFICATION OF CARBON FIBERS
Sang N. Kim, Randolph Township, Morris County; Paul E. McMahon, North Plainfield; John P. Riggs, New Providence, and John M. Rhodes, Summit, all of N.J., assignors to Celanese Corporation, New York, N.Y.
Filed Jan. 5, 1981, Ser. No. 222,790
Int. Cl.³ D01F 9/12
U.S. Cl. 423—447.1 27 Claims



1. An improved process for the modification of the surface characteristics of a carbonaceous fibrous material containing at least 90 percent carbon by weight so as to improve its ability to bond to a resinous matrix material while retaining a substantial portion of the tensile strength thereof comprising:

(a) continuously feeding to a substantially enclosed surface treatment zone maintained at a temperature of approximately 300° to 800° C. a gaseous atmosphere comprising approximately 1 to 25 percent by volume nitrogen dioxide and approximately 75 to 99 percent by volume air,

(b) continuously passing a continuous length of said carbonaceous fibrous material in the direction of its length through said surface treatment zone for a residence time of approximately 20 to 180 seconds, and

(c) continuously withdrawing the resulting continuous length of carbonaceous fibrous material from said surface treatment zone.

4,374,115

MAKING CALCIUM HYPOCHLORITE FROM IMPURE LIME

Herman H. Tiedemann, Texas City, Tex., assignor to Chemetics International Ltd., North York, Canada

Filed Aug. 25, 1981, Ser. No. 296,155

Claims priority, application Canada, Sep. 2, 1980, 359437

Int. Cl.³ C01B *11/06*

U.S. Cl. 423—474 **2 Claims**

1. A process for making calcium hypochlorite comprising passing chlorine through an aqueous solution of alkali metal hydroxides containing suspended particles of calcium hydroxide, said alkali metal hydroxides consisting of sodium hydroxide and potassium hydroxide wherein the ratio of sodium hydroxide to potassium hydroxide in the aqueous solution is such that 75% to 99% of the alkali metal ions in said solution are sodium ions and 1% to 25% are potassium ions, and wherein the calcium hydroxide is less than 96% pure.

4,374,116

METHOD OF COMBINING GASEOUS HYDROGEN AND OXYGEN AND APPARATUS THEREFOR

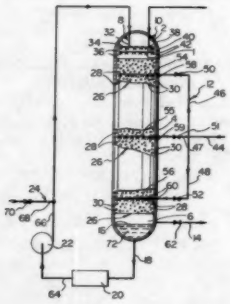
Karl T. Chuang, Deep River, and Maurice F. Roett, Calgary, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jun. 9, 1981, Ser. No. 271,961

Claims priority, application Canada, Nov. 3, 1980, 363863

Int. Cl.³ C01B *5/00*

U.S. Cl. 423—580 **4 Claims**



1. A method of combining gaseous hydrogen and oxygen comprising:

(a) distributing a flow of gaseous hydrogen in a catalytic assembly located in and substantially filling an intermediate portion of an upwardly extending casing,

(b) distributing a flow of cooling water, from a cooling water inlet to the casing, downwardly into the catalytic assembly from an upper portion of the casing,

(c) distributing gaseous oxygen in the upper portion of the casing,

(d) circulating draining water from a lower portion of the casing to the cooling water inlet, and

(e) removing a portion of the water from circulation, and wherein

(f) the catalyst assembly comprises at least one high surface area, inert, porous support with platinum particles embedded in the pores, and beneath the exterior thereof, and a polytetrafluoroethylene coating thereon over the platinum particules comprising about 0.1 to about 0.5 weight % of the total weight of support, platinum and polytetrafluoroethylene present in the catalyst assembly, and the polytetrafluoroethylene comprising about 2 to about 4 weight % of the total weight of support, platinum and polytetrafluoroethylene present in the catalyst assembly, so that:

(g) the catalyst does not rapidly lose its activity by contact with the cooling water and has a good conversion efficiency.

4,374,117

PREPARATION OF ULTRAFINE $BaZrO_3$

Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,367

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ C01G *23/00*

U.S. Cl. 423—593 **3 Claims**

1. A process for producing $BaZrO_3$ powder consisting essentially of providing barium oxide in an amount ranging from about 10 mole % to about 50 mole % in excess of stoichiometric amount or precursor therefor, providing zirconium oxide in about stoichiometric amount or precursor therefor, providing an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide and mixtures thereof, forming a mixture of said barium oxide or precursor therefor, said zirconium oxide or precursor therefor and said hydroxide solvent, heating said mixture to a reaction temperature ranging from about 980K to about 1375K, said hydroxide solvent being molten at said reaction temperature and in molten form being a solvent for said barium oxide and said zirconium oxide, said hydroxide solvent being used in an amount of at least about 20% by weight of the total amount of said reactants and said hydroxide solvent, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, maintaining said reaction temperature dissolving and reacting barium oxide and zirconium oxide in said molten solvent and precipitating $BaZrO_3$ and recovering said precipitated $BaZrO_3$.

4,374,118

PROCESS FOR STABILIZING FERROMAGNETIC CHROMIUM DIOXIDE

Giampiero Basile, Alessandria; Giancarlo Boero, Asti; Emiliano M. Ceresa, Vigliano Biellese, and Franco Montino, Casale Monferrato, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 206,190, Nov. 12, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,413

Claims priority, application Italy, Nov. 16, 1979, 27333A/79

Int. Cl.³ C01G *37/027*

U.S. Cl. 423—607 **5 Claims**

1. A process for stabilizing ferromagnetic chromium dioxide having before said stabilization:

(a) a coercive force $H_c \geqq$ about 400 Oersted;

(b) a maximum magnetic induction $B_m \geqq$ about 2500 gauss; and

(c) a residual magnetic induction $B_r \geqq$ about 1600 gauss

the process comprising subjecting said CrO_2 to a heat treatment at a temperature ranging between 300° and 390° C. in the presence of a stream of gas not exerting any oxidizing or reducing action on compounds of trivalent, tetravalent and hexavalent chromium, and selected from the group consisting of nitrogen and noble gases at a flow rate at least equal to 2.5 liters/hour/kg of CrO_2 and for a period of time ranging between 20 minutes and 15 hours.

4,374,119

PROCESS FOR THE PRODUCTION OF COARSE CRYSTALLINE ALUMINA

Bernhard Schepers, Bergheim, Fed. Rep. of Germany; Volker Nobbe, Neuhausen, Switzerland; Bernd Schröder, Cologne, Fed. Rep. of Germany; Werner Borer, Flurlingen, Switzerland, and Manfred Kullack, Bergheim, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 16, 1981, Ser. No. 302,555

Claims priority, application Switzerland, Sep. 23, 1980, 7126/80

Int. Cl.³ C01F 7/02

U.S. Cl. 423—625 12 Claims

1. Process for the production from aluminum hydroxide of coarse crystalline alumina, α-Al_2O_3, with a mean crystallite diameter of $>10\mu$, which comprises mixing aluminum hydroxide and a mineralizer of compound type $x(BF_4)_n$, wherein x stands for NH_4 and metallic elements with a valence of 1 or 2, and n for the formal valence level of x, and subjecting said mixture to an elevated temperature treatment between 750° C. and a value lying above that required for the phase change to α-Al_2O_3 to convert said aluminum hydroxide to the α-Al_2O_3.

4,374,120

FLUORESCENCE SPECTROSCOPY ASSAY MEANS WITH FLUORESCENT CHELATE OF A LANTHANIDE

Erkki Soini, and Ilkka Hemmilä, both of Turku, Finland, assignors to Wallac Oy, Turku, Finland

Filed Mar. 7, 1980, Ser. No. 128,621

Claims priority, application Sweden, Mar. 8, 1979, 7902079

Int. Cl.³ G01N 21/33, 33/48, 33/52

U.S. Cl. 436—546 18 Claims

1. In a method for the determination of a substance by means of fluorescence spectroscopy in which a fluorescence marker is coupled to the molecules of the substance, the fluorescence of the marker having a duration which substantially exceeds the duration of the fluorescence of possible noise sources and in which the substance is excited by means of a short pulse of radiation and the fluorescence thereby generated is detected when the fluorescence from the sources of noise has in principle ceased, the improvement comprising using as said fluorescent marker a 1:1:1 fluorescent chelate of europium or terbium, β-diketone or a dihydroxy compound, and an aminopolycarboxylic acid analogue, said chelate having a stability constant above 10^{10} wherein

(a) the europium or terbium is the fluorescence emission source and is chelated to the aminopolycarboxylic acid analogue,

(b) the aminopolycarboxylic acid analogue has a functional group for covalent binding to said substance, and

(c) said β-diketone or said dihydroxy compound excites fluorescence of said fluorescence emission source.

4,374,121

MACROMOLECULAR BIOLOGICALLY ACTIVE COLLAGEN ARTICLES

Gheorghe Cioca, Belleville, N.J., assignor to Seton Company, Newark, N.J.

Continuation-in-part of Ser. No. 74,738, Sep. 12, 1979, Pat. No. 4,279,812. This application Sep. 24, 1980, Ser. No. 190,372

Int. Cl.³ C07G 7/00

U.S. Cl. 424—19 5 Claims

1. A process of preparing macromolecular reconstituted collagen fiber comprising:

(a) treating natural insoluble collagen with an aqueous solution comprised of 0.5 to 1 molar of an alkali sulfate salt and 1.0 to 2.5 molar of an alkali metal hydroxide for at least 48 hours and up to 96 hours to saponify fats suspended within the natural insoluble collagen and to uniformly swell the collagen fibers;

(b) treating the fat free collagen with an aqueous solution comprised of an alkali metal sulfate for at least four hours to stabilize the interfibular bonds;

(c) dissolving the collagen in an aqueous solution;

(d) adding an effective amount of a biologically active substance to said solution;

(e) freezing said solution to effect a temperature reduction rate of −18° C. to −24° C./hour to a temperature of −60° C. to −70° C.; and

(f) vacuum drying said solution at 10^{-3} to 10^{-5} torr for at least 12 hours.

4,374,122

METHOD OF REDUCING DENTAL CARIES

John J. Stroz, Monroe, Conn., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Nabisco Brands, Inc., New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,088

Int. Cl.³ A61K 7/16, 9/68

U.S. Cl. 424—48 9 Claims

1. A method of treating teeth to reduce or prevent caries by inhibiting growth of *Steptococcus Mutans* in the presence of fermentable carbohydrates in the oral cavity, which comprises contacting the teeth with an anti-caries compound comprising 3,4-dihydro-6-methyl-1,2,3-oxathiazine-4-one-2,2-dioxide or a water-soluble salt thereof in conjunction with a carrier which includes sugar to form a composition containing from about 0.05 to about 5% by weight anti-caries compound whereby the incidence of caries is inhibited or prevented in comparison to the incidence of caries expected as a result of inclusion of sugar in said composition.

4,374,123

FLAVORING WITH 4-METHYL-3-CYCLOHEXENE-1-CARBOXYLIC ACID

Domenick Luccarelli, Jr., Ocean, and Takao Yoshida, West Long Beach, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 322,842

Int. Cl.³ A23L 1/235

U.S. Cl. 424—49 4 Claims

1. A process for augmenting or enhancing the aroma or taste of a blueberry, raspberry or blackberry flavored foodstuff, chewing gum, medicinal product or toothpaste comprising the step of adding to a foodstuff, medicinal product, toothpaste or chewing gum base from 0.05 parts per million up to about 300 parts per million based on the total composition of 4-methyl-3-cyclohexene-1-carboxylic acid.

4,374,124

DENTAL PLAQUE-PREVENTIVE OXAZOLIDINE CONTAINING COMPOSITIONS AND METHOD

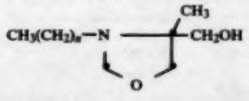
Michael Jarcho, El Cajon, Calif., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,573

Int. Cl.³ A61K 7/16, 7/22

U.S. Cl. 424—54 6 Claims

1. An oral composition for the prevention of dental plaque comprising an effective amount consisting from 1.0% to 0.001% by weight of a compound having the formula:



where n is an integer from 15 to 17, and a compatible, pharmaceutically acceptable tooth paste, tooth powder, tooth ointment, mouthwash, troche, lozenge, chewing gum, food or drink carrier.

4,374,125
HAIR MOISTURIZING COMPOSITIONS

Gerald P. Newell, Hanover Park, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,360
Int. Cl.³ A61K *7/06, 47/00*
U.S. Cl. 424—70 **9 Claims**

1. An aqueous hair treatment composition for restoring and maintaining the proper moisture level in hair comprising from about 0.01 to about 1 weight percent of sodium-2-pyrrolidone-5-carboxylate, from about 0.1 to about 5.0 weight percent of glycerin and from about 0.1 to about 5.0 weight percent of protein derived from a collagenous source, said protein being soluble in at least one liquid of the group consisting of water and ethanol.

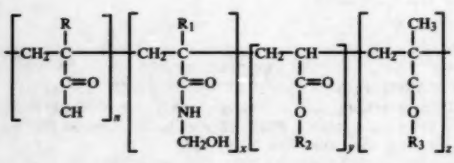
4,374,126
FILM FORMING ANTIMICROBIAL MATERIAL

Nathan F. Cardarelli, Barberton, and William H. Evans, Akron, both of Ohio, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 23, 1981, Ser. No. 237,051
Int. Cl.³ A61K *31/78*
U.S. Cl. 424—81 **14 Claims**

1. An alcohol insoluble, antimicrobial topical coating composition comprising:

A. from about 6% to about 13% by weight of said composition of a lower acrylate interpolymer which has the formula:



wherein R and R_1 each represents hydrogen and methyl, R_2 represents either methyl, ethyl, propyl or butyl; R_3 represents methyl or ethyl; n represents from 3 to 12 weight percent based on combined weight of x, y and z; x represents from 8 to 25 weight percent based on the combined weight of n and z; y represents from 45 to 89 weight percent based on combined weight of n, x and z; z represents from 0 to 44 weight percent based on the combined weights of n, x and y, the sum of the numerical values of n+x+y+z s always 100 and the groups n, x, y and z are present in the polymer in a heterogeneous relative order;

B. from about 1% to about 3% by weight of said composition of urea as a cross linking agent; and

C. the remainder comprising an adhesion-promoting material selected from the group consisting of a secondary solvent, an emollient, and mixtures thereof, and at least one antimicrobial agent.

4,374,127
HERPES SUB UNIT VACCINE

Vivian M. Larson, Harleysville, and E. Dale Lehman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 934,554, Aug. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,598, Sep. 19, 1977, abandoned. This application Feb. 11, 1980, Ser. No. 120,409
Int. Cl.³ A61K *39/245*
U.S. Cl. 424—89 **8 Claims**

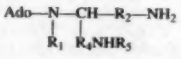
1. An antigenic, immunogenic HSV-2 subunit vaccine consisting essentially of 3 groups of viral directed membrane-bound glycoproteins which are soluble in the presence of a non-ionic or anionic surfactant, the first of the three groups being from about 110,000 to about 130,000 daltons, the second of the three groups being from about 83,000 to about 90,000 daltons, and the third of the three groups being from about 55,000 to about 60,000 daltons, the subunit vaccine being substantially free of intact DNA and being capable of inducing neutralizing antibody and of being administered as a vaccine at a protein use level of from about 1 to about 100 μg.

4,374,128
SUBSTITUTED DEOXYADENOSINE DERIVATIVES

Philippe Bey, Strasbourg; Michel Jung, Illkirch-Graffenstaden; Michael Kolb, Truchtersheim, and Charles Danzin, Strasbourg, all of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Mar. 13, 1981, Ser. No. 243,280
Claims priority, application United Kingdom, Mar. 25, 1980, 8009995
Int. Cl.³ A61K *31/70;* **C07H** *19/16*
U.S. Cl. 424—180 **16 Claims**

1. A 5'-N-(aminoalkyl)amino-5'-deoxyadenosine of the formula



wherein:
Ado represents 5'-deoxyadenosine-5'-yl;
R_1 represents hydrogen, methyl or ethyl;
R_2 represents C_1–C_8 alkylene;
R_4 represents C_1–C_8 alkylene;
R_5 represents hydrogen, C_1–C_6 alkyl or —R_6NHR_7;
R_6 represents C_1–C_4 alkylene; and
R_7 represents hydrogen or C_1–C_4 alkyl or a pharmaceutically acceptable acid addition salt thereof.

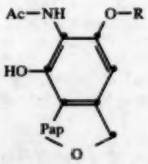
15. A pharmaceutical composition for controlling undesirable cell proliferation in a warm-blooded animal in need thereof comprising a therapeutically effective amount of a compound as claimed in claim 1 as an active ingredient and a pharmaceutically acceptable diluent or carrier.

4,374,129
ANTIBIOTICALLY ACTIVE AMINOPAPULACANDIN DERIVATIVES

Peter Traxler, Schönenbuch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

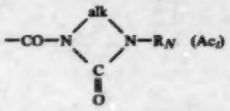
Filed Dec. 14, 1981, Ser. No. 330,409
Claims priority, application Switzerland, Dec. 16, 1980, 9266/80
Int. Cl.³ A61K *31/71;* **C07H** *13/04*
U.S. Cl. 424—180 **18 Claims**

1. An N-acylated 11-amino derivative of papulacandin A or B of the formula I



(I)

in which Pap is the remainder of papulacandin A or B, R represents methyl or hydrogen and Ac represents the acyl radical of an α-amino acid which occurs naturally as a peptide-building unit, or of a lower alkanesulfonic acid having a maximum of 7 carbon atoms, or a lower alkanoic acid having a maximum of 7 carbon atoms, or the acyl radical Ac_f of the formula



in which R_N represents hydrogen, formyl, lower alkoxycarbonyl, carbamoyl, hydroxy-lower alkyl or a hydrocarbyl having a maximum of 8 carbon atoms, and alk represents an alkylene radical having from 2–8 carbon atoms which separates the two nitrogen atoms from each other by a minimum of 2 and a maximum of 4 carbon atoms, or an acid addition salt of said compound in which Ac is the acyl radical of an α-amino acid.

17. Therapeutic method for inhibiting or eliminating microbial infections in a warm-blooded animal by the administration to this warm-blooded animal of a compound according to any one of claims 1, 12, or 13 alone or in the form of a pharmaceutical preparation in amounts that are effective for the inhibition or elimination of the infection in this warm-blooded animal.

4,374,130

4,4'-(ALKANEDIYL)-BIS(2,2,6,6-TETRAALKYL-1-OXA-4-AZA-2,6-DISILACYCLOHEXANES)

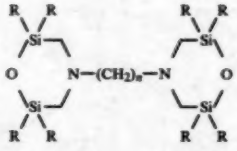
Sandor Barcza, Mountain Lakes, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 173,459, Jul. 30, 1980, abandoned. This application Jan. 22, 1981, Ser. No. 227,179

Int. Cl.³ A61K *31/695*

U.S. Cl. 424—184 **3 Claims**

1. A pharmaceutical composition for inhibiting glucagon which comprises a glucagon inhibiting effective amount of a compound of the formula,



wherein

each R, independently, is C_{1-4}-alkyl, and

n is an integer 3, 5 or 7,

or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,374,131

AMINO AND SUBSTITUTED AMINO PHOSPHINYL-ALKANOYL COMPOUNDS

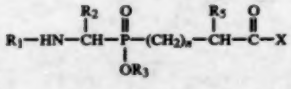
Edward W. Petrillo, Jr., Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 27, 1981, Ser. No. 258,194

Int. Cl.³ A61K *31/675*; **C07F** *9/30, 9/32*

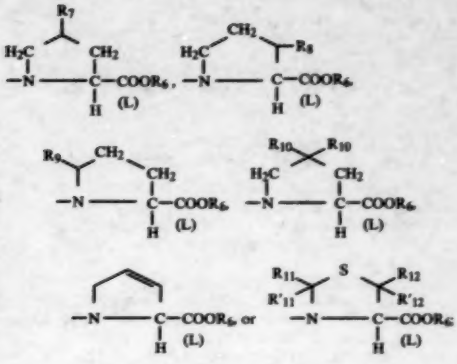
U.S. Cl. 424—200 **37 Claims**

1. A compound of the formula

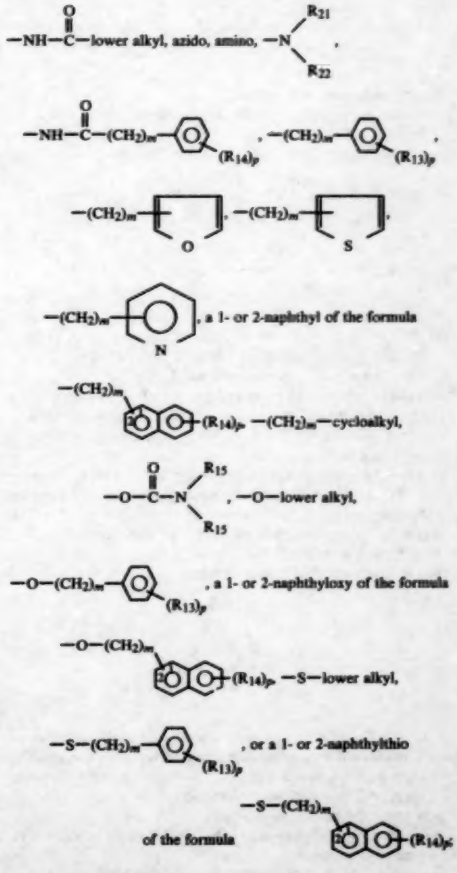


wherein

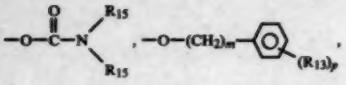
X is an imino acid of the formula



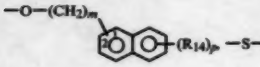
R_7 is hydrogen, lower alkyl, halogen, keto, hydroxy,



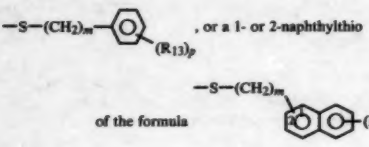
R_8 is keto, halogen,



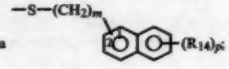
O—lower alkyl, a 1- or 2-naphthyloxy of the formula



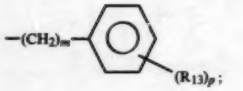
—S—lower alkyl,



of the formula

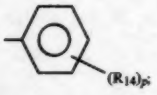


R_9 is keto or



R_{10} is halogen or —Y—R_{16};

R_{11}, R_{11}', R_{12} and R_{12}' are independently selected from hydrogen and lower alkyl or R_{11}', R_{12} and R_{12}' are hydrogen and R_{11} is



R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

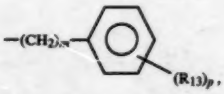
m is zero, one, two or three;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

Y is oxygen or sulfur;

R_{16} is lower alkyl of 1 to 4 carbons,

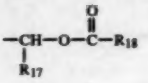


or the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

n is zero or one;

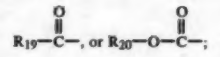
R_5 is hydrogen, lower alkyl, halo substituted lower alkyl, benzyl or phenethyl;

R_3 and R_6 are independently selected from hydrogen, lower alkyl, benzyl, benzhydryl, or

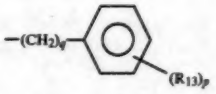


wherein R_{17} is hydrogen, lower alkyl, or phenyl, and R_{18} is hydrogen, lower alkyl, lower alkoxy, phenyl, or R_{17} and R_{18} taken together are —$(CH_2)_2$—, —$(CH_2)_3$—, —CH=CH—, or

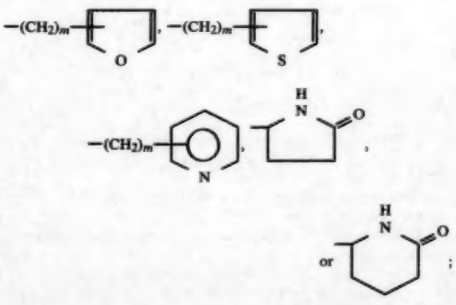
R_1 is hydrogen,



R_{19} is hydrogen, lower alkyl, halo substituted lower alkyl, amino substituted lower alkyl,



wherein R_{13} and p are as defined above and q is zero or an integer from 1 to 7, cycloalkyl,

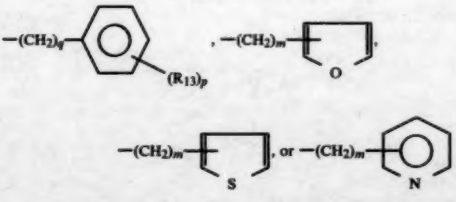


R_{20} is lower alkyl, phenyl, benzyl or phenethyl;

R_{21} is lower alkyl, benzyl or phenethyl;

R_{22} is hydrogen, lower alkyl, benzyl or phenethyl;

R_2 is hydrogen, lower alkyl, lower alkenyl, halo substituted lower alkyl,



wherein q, R_{13}, p and m are as defined above; and when either or both of R_3 and R_6 are hydrogen a basic addition salt or an amino acid addition salt thereof.

36. A pharmaceutical composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and one or more compounds of claim 1 or pharmaceutically acceptable salts thereof.

4,374,132

PLASMA URIC ACID LOWERING METHOD

Joan R. Dembinski, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Dec. 10, 1979, Ser. No. 101,628
Int. Cl.³ A61K *31/58*
U.S. Cl. 424—241 **1 Claim**

1. The method of treating a person other than a pregnant female person having an abnormally high plasma uric acid concentration which comprises administering to the person an amount of 17β-hydroxy-4,4,17α-trimethyl-5-androsteno[2,3-d]isoxazole effective in lowering the plasma uric acid concentration.

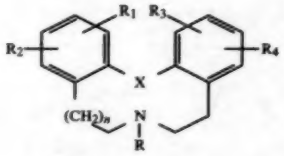
4,374,133

TRICYCLIC COMPOUNDS

Johannes H. Wieringa, Heesch, Netherlands, assignor to Akzo n.v., Oss, Netherlands

Filed Dec. 16, 1981, Ser. No. 331,303
Claims priority, application Netherlands, Dec. 22, 1980, 8006955
Int. Cl.³ A61K *31/395*; C07D *245/04, 267/00, 281/00*
U.S. Cl. 424—244 **4 Claims**

1. Compound of the general formula I:



or a pharmaceutically acceptable acid addition salt or nitrogen oxide thereof, in which

X represents oxygen, sulphur or the group NR_5,

R_5 is hydrogen or alkyl (1–4 C),

R_1, R_2, R_3, R_4 each represent hydrogen, hydroxy, halogen, cyano, alkyl, alkoxy, aralkoxy, alkylthio, methylenedioxy, CF_3, NO_2, NH_2, hydroxyalkyl, or an acyloxy group,

R represents hydrogen, alkyl, alkenyl or aralkyl, hydroxyalkyl or acyloxyalkyl and

n represents the number 0, 1 or 2.

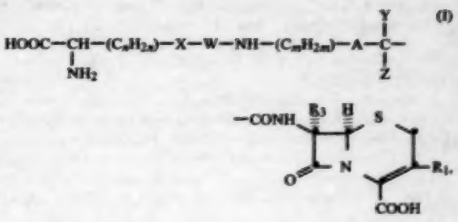
4,374,134

CEPHALOSPORIN COMPOUNDS WITH TERMINAL AMINOCARBOXYLIC ACID GROUPINGS AND ANTI-BACTERIAL USE THEREOF

Karoly Kocsis; Peter Schneider, both of Basel; Bruno Fechtig, Reinach, and Riccardo Scartazzini, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 923,524, Jul. 11, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,591
Claims priority, application Luxembourg, Jul. 18, 1977, 77786
Int. Cl.³ A61K *31/575*; C07D *501/38, 507/46*
U.S. Cl. 424—246 **13 Claims**

1. An acylamino-3-cephem-4-carboxylic acid compound of the formula



(I)

in which

n represent an integer from 1 to 4,

m represents 0 or 1,

X represents oxygen, sulphur or the —NH— group,

W represents the —CO—, —CO—$NHSO_2$— or —SO_2—$NHSO_2$— group, or

X-W together represent the —CO— or —CO—$NHSO_2$— group,

A represents phenylene, thienylene or furylene, or such group substituted by lower alkyl, lower alkoxy and/or halogen,

Y represents hydrogen, hydroxyl, formyloxy, amino or sulpho,

Z represents hydrogen, or

Y and Z together represent an oxo group or an =N—OR^o group in which R^o represents hydrogen, lower alkyl, or lower alkyl substituted by lower alkoxy, halogen, hydroxy, lower alkanoyloxy, sulpho, carboxy or lower alkoxycarbonyl,

R_1 represents hydrogen, lower alkyl, lower alkoxy, halogen or a group of the formula —CH_2—R_2, in which R_2 is free hydroxy or mercapto, lower alkanoyloxy, carbamoyloxy, lower alkylcarbamoyloxy, lower alkanoylthio, carbamoylthio, lower alkylcarbamoylthio, lower alkoxy, heterocyclylthio selected from the group consisting of imidazolylthio, triazolylthio, triazolylthio substituted by lower alkyl, tetrazolylthio, tetrazolylthio substituted by lower alkyl, di-lower alkylamino lower alkyl, sulfo-lower alkyl or carboxy-lower alkyl, thiazolylthio or isothiazolylthio substituted by lower alkyl or thienyl, thiadiazolylthio, thiadiazolylthio substituted by lower alkyl or carboxy-lower alkyl, thiatriazolylthio, oxazolylthio, isoxazolylthio, oxazolylthio or isoxazolylthio substituted by lower alkyl, oxadiazolylthio or oxadiazolylthio substituted by lower alkyl, 1-oxidopyridylthio, 1-oxidopyridylthio substituted by halogen, pyridazinylthio, pyridazinylthio substituted by hydroxy, N-oxidopyridazinylthio, N-oxidopyridazinylthio substituted by lower alkyl, lower alkoxy, or halogen, 2-oxo-1,2-dihydropyrimidinylthio and 2-oxo-1,2-dihydropyrimidinylthio substituted by lower alkyl, amino, di-lower alkylamino or carboxy,

or R_2 is a quaternary ammonium group selected from the group consisting of tri-lower alkyl ammonium, pyrimidinium, pyridazinium, thiazolium, quinolinium, pyridinium and pyridinium substituted by lower alkyl, hydroxy-lower alkyl, amino, 4-aminophenylsulfonamido, hydroxy, halogen, halogen-lower alkyl, sulfo, carboxy, lower-alkoxycarbonyl, cyano, carbamoyl, lower alkylcarbamoyl, di-lower alkylcarbamoyl, hydrazinocarbonyl, carboxy-lower alkyl, lower alkanoyl or 1-lower alkylpyrrolidinyl, and R_3 represents hydrogen or methoxy, and wherein the term "lower" indicates the group to which it is connected is having one to four carbon atoms, and the pharmaceutically acceptable salts thereof.

4,374,135

COMPOSITIONS CONTAINING ANOREXIGENIC COMPOUNDS AND METHODS FOR REGULATING THE FEED INTAKE OF HOMOTHERMIC ANIMALS

Melvin C. Johnson, East Brunswick, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 5, 1980, Ser. No. 213,287

Int. Cl.³ A61K *31/505, 31/33, 31/15*

U.S. Cl. 424—251 **13 Claims**

1. A method for reducing the appetite of animals comprising homothermic zoo animals, companion animals and rodents which comprises administering to said animals orally or parenterally an appetite suppressing amount of a compound selected from the group consisting of 1,5-bis(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one, (1,4,5-6-tetrahydro-5,5-dimethyl-2-pyrimidinyl)hydrazone; 1,5-bis(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one-(E,E)-azine with hexahydro-2H-1,3-diazepin-2-one; 1,5-bis(p-chlorophenyl)-1,4-pentadien-3-one, (1,4,5,6-tetrahydro-5,5-dimethyl-2-pyrimidinyl)hydrazone; 1,5-bis-(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one, (1,4,5,6-tetrahydro-2-pyrimidinyl)hydrazone; and acid addition salts thereof.

4,374,136

PYRIMIDINE DERIVATIVES

Jack Hill, London; Brian W. Sharp, Hornchurch; Dennis Warburton, Brentwood, all of England; Robert B. Walker, deceased, late of Hornchurch, England, and by Thomas Walker, administrator, Chester, England, assignors to May & Baker Limited, Essex, England

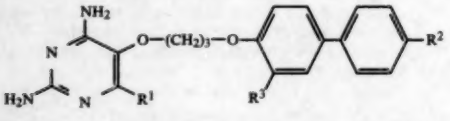
Filed Oct. 21, 1981, Ser. No. 313,493

Claims priority, application United Kingdom, Oct. 27, 1980, 8034572

Int. Cl.³ C07D *239/48;* **A61K** *31/305*

U.S. Cl. 424—251 **6 Claims**

1. A pyrimidine derivative of the formula:



wherein R^1 represents methyl or ethyl, R^2 represents bromine or chlorine, and R^3 represents hydrogen, chlorine, bromine or iodine, or alkyl of 1 through 4 carbon atoms, alkenyl of 2 through 4 carbon atoms, cyano or trifluoromethyl, and its pharmaceutically acceptable acid addition salts.

4,374,137

SPIRO[BENZOFURANISOQUINOLINE]S AND THEIR USE AS PHARMACEUTICALS

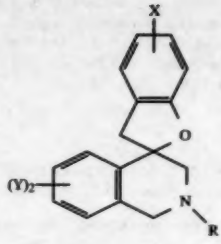
Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Joseph T. Klein, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Aug. 7, 1981, Ser. No. 290,987

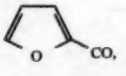
Int. Cl.³ A61K *31/47;* **C07D** *491/07*

U.S. Cl. 424—258 **72 Claims**

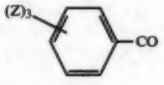
1. A compound of the formula



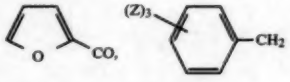
wherein Y is hydrogen or methoxy; X is hydrogen or halogen; R is hydrogen, loweralkyl, loweralkenyl, loweralkynyl, cycloalkylloweralkyl having 3 to 10 carbon atoms in the cycloalkyl moiety, cycloalkylcarbonyl having 3 to 10 carbon atoms in the cycloalkyl moiety, loweralkanoyl,



$COOR^1$, wherein R^1 is loweralkyl or phenyl, $COCOOR^2$ wherein R^2 is loweralkyl,

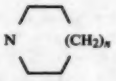


wherein Z is methoxy,

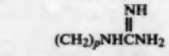


wherein Z is hydrogen or methoxy, NH_2, NO,

$CH_2CR^3H(CH_2)_mNR^4R^5$ wherein R^3 is hydrogen or loweralkyl, m is 0 or 1, R^4 and R^5 are each independently hydrogen or loweralkyl, or R^4 and R^5 taken together with the nitrogen atom to which they are attached form a group of the formula



wherein n is 0 or 1,

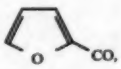


wherein p is 2, $(CH_2)_qCN$ wherein q is 0 or 1,

wherein R^6 is loweralkyl,

wherein R^6 is loweralkyl,

wherein R^7 is loweralkyl and R^8 is $(CH_2)_rNR^4R^5$ wherein R^4 and R^5 are as above and r is 2 or 3, the tautomers, geometrical isomers and optical antipodes thereof or the pharmaceutically acceptable acid additional salts thereof when R is other than cycloalkylcarbonyl having 3 to 10 carbon atoms in the cycloalkyl moiety, loweralkanoyl,



$COOR^1$ wherein R^1 is as above, $COCOOR^2$ wherein R^2 is as above,

wherein Z is as above, NO, $(CH_2)_qCN$ wherein q is 0 and

is as above.

65. A method of producing diuresis comprising administering to a mammal in need of diuresis a diuretically effective amount of a compound as defined in claim 1 or 12 or 52.

4,374,138

ANTIBACTERIAL AMIDE COMPOUNDS, COMPOSITIONS, AND METHODS OF USE

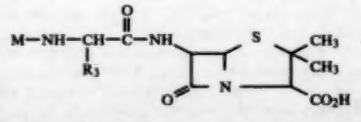
Theodore H. Haskell, Ann Arbor, and Marland P. Hutt, Saline, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1981, Ser. No. 321,020

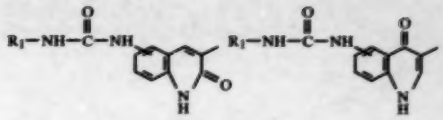
Int. Cl.³ A61K *31/47;* **C07D** *499/70, 215/22*

U.S. Cl. 424—258 **10 Claims**

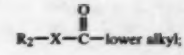
1. A compound of the formula



and pharmaceutically acceptable salts thereof; wherein M is



R_1 is lower alkyl or



R_2 is hydrogen or lower alkyl; X is O or NH and R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl.

4,374,139

LEVOROTATORY N-SUBSTITUTED ACYLMORPHINANS USEFUL AS ANALGESIC AGENTS

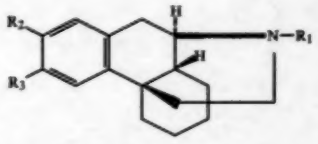
Ernest Mohacsi, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 9, 1981, Ser. No. 319,482

Int. Cl.³ A61K *31/485;* **C07D** *221/28*

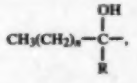
U.S. Cl. 424—260 **22 Claims**

1. A compound of the formula



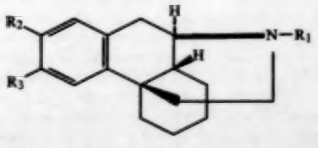
I

wherein R_1 is hydrogen, lower alkyl, lower alkenyl, cycloalkyl-lower alkyl, cyano-lower alkyl, phenyl-lower alkyl, naphthyl-lower alkyl or 5- or 6-membered heterocyclic-lower alkyl selected from the group consisting of thienyl-lower alkyl, pyrrolyl-lower alkyl, furyl-lower alkyl, pyridyl-lower alkyl and pyranyl-lower alkyl, and one of R_2 or R_3 is hydrogen and the other of R_2 or R_3 is alkanoyl of 2 to 7 carbon atoms, benzoyl, naphthoyl, trifluoromethylcarbonyl, or



wherein R is hydrogen or lower alkyl and n is 0 to 6, or a salt thereof with a pharmaceutically acceptable acid addition salt.

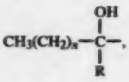
20. A pharmaceutical composition comprising an analgesically effective amount of a compound of the formula



I

wherein R_1 is hydrogen, lower alkyl, lower alkenyl, cycloalkyl-lower alkyl, cyano-lower alkyl, phenyl-lower alkyl, naphthyl-lower alkyl or 5- or 6-membered heterocyclic-lower alkyl selected from the group consisting of thienyl-lower alkyl,

pyrrolyl-lower alkyl, furyl-lower alkyl, pyridyl-lower alkyl and pyranyl-lower alkyl, and one of R_2 or R_3 is alkanoyl of 2 to 7 carbon atoms, benzyl, naphthoyl, trifluoromethylcarbonyl, or



wherein R is hydrogen or lower alkyl and n is 0 to 6, or a salt thereof with a pharmaceutically acceptable acid addition salt, and an inert pharmaceutical carrier.

4,374,140

2-SUBSTITUTED PROPOXY-3-CYANO-5-HYDROXYPYRIDINES AND USE AS ANTIHYPERTENSIVES

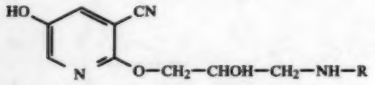
John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, Lansdale; Stanley Vickers, Perkasie, all of Pa., and Alfred Steuerwald, Orbis, Fed. Rep. of Germany, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 80,812, Oct. 1, 1979, abandoned. This application Feb. 10, 1981, Ser. No. 233,275

Int. Cl.³ A61K *31/44;* **C07D** *213/84*

U.S. Cl. 424—263 **7 Claims**

1. Compounds of the formula



and pharmaceutically acceptable salts thereof wherein R is isopropyl or t-butyl.

4,374,141

2-SUBSTITUTED AMINO-5-(PYRIDINYL)-NICOTINAMIDES AND THEIR CARDIOTONIC USE

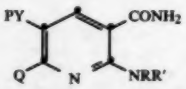
George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,248

Int. Cl.³ C07D *401/04;* **A61K** *31/455*

U.S. Cl. 424—266 **11 Claims**

1. A 2-RR'N-5-PY-6-Q-nicotinamide having the formula



where Q is hydrogen or lower-alkyl, R is lower-alkyl, lower-hydroxyalkyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages, R' is hydrogen or methyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically acceptable acid-addition salt thereof.

6. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically acceptable inert carrier and, as the active component thereof, a cardiotonically effective amount of 2-RR'N-5-PY-6-Q-nicotinamide or pharmaceutically acceptable acid-addition salt thereof, where Q is hydrogen or lower-alkyl, R is lower-alkyl, lower-hydroxyalkyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages, R' is hydrogen or methyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,374,142

BISDITHIOCARBAMATE ESTERS OF DI-LOWER ALKYL FORMALS

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 125,830, Feb. 29, 1980, abandoned, which is a continuation of Ser. No. 766,660, Feb. 8, 1977, abandoned. This application Oct. 14, 1980, Ser. No. 196,899

Int. Cl.³ A01N *43/40, 43/48, 43/78, 47/10*

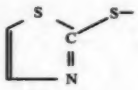
U.S. Cl. 424—270 **6 Claims**

1. A composition comprising

(i) a biocide, in an amount effective to inhibit the growth of plant infections, which must conform to the formula

$$Q-(CH_2)_n-(OCH_2)_m-O-(CH_2)_n-X$$

wherein Q is a 2-mercaptothiazole radical of the following formula



which is either unsubstituted or substituted with alkyl of from 1 to 10 carbon atoms, carbocyclic aryl of 6 or 10 carbon atoms in the aryl nucleus, or fused to a mono or bicyclic carbocyclic aryl of 6 or 10 carbon atoms in the aryl nucleus;

X is a monovalent radical which is either Q or —Cl,

n is an integer of from 2 to about 10;

m is an integer of from 1 to 3

(ii) an agriculturally acceptable carrier.

4,374,143

2-ARYLIMINO-IMIDAZOLIDINES, COMPOSITIONS CONTAINING SAME, AND METHOD OF USE THEREOF

Hendrik Dolman, and Johannes Kuipers, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Netherlands

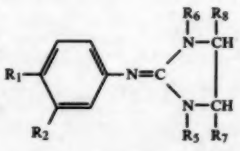
Division of Ser. No. 948,735, Oct. 5, 1978, abandoned. This application May 18, 1981, Ser. No. 264,460

Claims priority, application Netherlands, Oct. 18, 1977, 7711390

Int. Cl.³ A01N *43/50;* **C07D** *233/50*

U.S. Cl. 424—273 R **6 Claims**

1. A compound of the formula



wherein

one of R_1 and R_2 is C_3–C_7 cycloalkyl and the other is C_3–C_7 cycloalkyl or a hydrogen atom,

R_5 and R_6 are equal or different and represent any of a hydrogen atom, C_1–C_4 alkyl, or C_2–C_5 alkanoyl,

R_7 and R_8 are equal or different and represent any of a hydrogen atom or C_1–C_4 alkyl, and

fungicidally acceptable acid addition salts or complexes thereof.

4,374,144

β-LACTAM COMPOUNDS, THEIR PREPARATION AND USE

David F. Corbett, Dorking, England, assignor to Beecham Group Limited, England

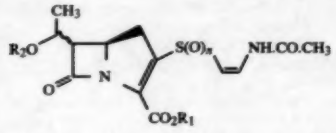
Continuation of Ser. No. 68,890, Aug. 23, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,509

Claims priority, application United Kingdom, Sep. 9, 1978, 36266/78

Int. Cl.³ A61K 31/40; C07D 487/04

U.S. Cl. 424—274 62 Claims

1. A compound of the formula (VII):



(VII)

wherein CO_2R_1 is carboxylic acid, a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof, n is 0 and R_2 is hydrogen, or a group of the sub-formula (a):

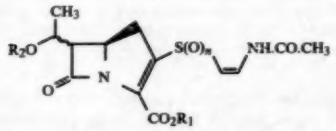
(a)

wherein R_3 is a pharmaceutically acceptable salting ion, methyl or ethyl, or a group of the sub-formula (b):

(b)

wherein R_4 is R_5 or NHR_5 wherein R_5 is alkyl of up to 6 carbon atoms, alkenyl of up to 6 carbon atoms, phenyl unsubstituted or substituted by alkyl of up to 3 carbon atoms, alkoxyl of up to 3 carbon atoms, chlorine or fluorine or alkyl of up to 6 carbon atoms substituted by phenyl or phenyloxy which itself is unsubstituted or nuclear substituted by alkyl of up to 3 carbon atoms, alkoxyl of up to 3 carbon atoms, chlorine or fluorine, with the proviso that when R_2 is a group of the formula (a) the compound has cis stereochemistry about the β-lactam ring.

19. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula (VII):



(VII)

wherein CO_2R_1 is carboxylic acid, a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof, n is O and R_2 is hydrogen, a group of the sub-formula (a):

(a)

wherein R_3 is a pharmaceutically acceptable salting ion, methyl or ethyl, or a group of the sub-formula (b):

(b)

wherein R_4 is R_5 or NHR_5 is alkyl of up to 6 carbon atoms, alkenyl of up to 6 carbon atoms, phenyl unsubstituted or substituted by alkyl of up to 3 carbon atoms, alkoxyl of up to 3 carbon atoms, chlorine or fluorine or alkyl of up to 6 carbon atoms substituted by phenyl or phenyloxy which itself is unsubstituted or nuclear substituted by alkyl of up to 3 carbon atoms, alkoxyl of up to 3 carbon atoms, chlorine or fluorine, with the proviso that when R_2 is a group of the formula (a) the compound has cis stereochemistry about the β-lactam ring, in combination with a pharmaceutically acceptable carrier.

4,374,145

TIN COMPOUNDS

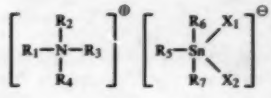
Wolfgang Wehner, Zwingenberg, Fed. Rep. of Germany; Saleem Farooq, Ettingen, Switzerland, and Hans-Günter Köstler, Heppenheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,570

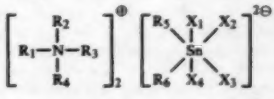
Int. Cl.³ A01N 59/16; C07F 7/22

U.S. Cl. 424—278 9 Claims

1. An organo-tin substituted ammonium salt of the formula:



or of the formula:



wherein each of R_1, R_2, and R_3 is hydrogen or the same or different alkyl of up to 20 carbon atoms;

R_4 is epoxyalkyl, haloalkyl or halohydroxyalkyl, each containing up to 6 carbon atoms;

R_5 is alkyl of up to 6 carbon atoms, cyclohexyl or phenyl;

each of R_6 and R_7, independently of the other, is either the same as R_5 or the same as X_1 as hereinafter defined;

X_1 is chloro or bromo; and

X_2, X_3 and X_4 are either all chloro or all bromo.

4,374,146

TOPICAL INFLAMMATORY PHARMACEUTICAL FORMULATIONS

Arthur P. Phillips, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Nov. 23, 1981, Ser. No. 323,803

Claims priority, application United Kingdom, Nov. 26, 1980, 8037873

Int. Cl.³ A61K 31/36

U.S. Cl. 424—282 8 Claims

1. A method for the treatment or prophylaxis of a condition selected from pain, inflammation and pyresis in a mammal comprising the administration to said mammal of a non-toxic, effective analgesic, anti-inflammatory or antipyretic amount of a compound of N-(1,3-benzodioxol-5-yl) acetamide.

4,374,147

13-OXO-MONIC ACID ESTERS USEFUL AS ANTIBACTERIAL AND ANTIMYCOPLASMAL AGENTS

Kong Luk, Horley, and Norman H. Rogers, Horsham, both of England, assignors to Beecham Group Limited, England

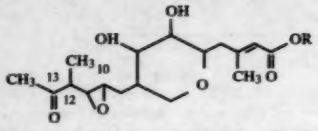
Filed Jun. 5, 1981, Ser. No. 271,006

Claims priority, application United Kingdom, Jun. 14, 1980, 8019509

Int. Cl.³ A61K 31/35; C07D 309/06

U.S. Cl. 424—283 7 Claims

1. A compound of formula (II):



(II)

in which R is a pharmaceutically acceptable ester-forming radical.

7. A method for treating bacterial or mycoplasmal infections of humans or animals, comprising the administration of an effective, non-toxic amount of the pharmaceutically acceptable ester according to claim 1 or a pharmaceutically acceptable salt of said ester where said ester-forming radical is substituted by carboxy, to the infected human or animal.

4,374,148
CARBOXYLIC ACID THERAPEUTIC AGENTS

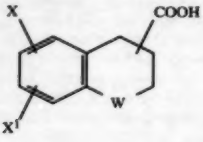
John L. Belletire, Cincinnati, Ohio, assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 199,153, Oct. 21, 1980, Pat. No. 4,305,955. This application Jul. 13, 1981, Ser. No. 282,762

Int. Cl.³ A61K *31/165, 31/19, 31/235*

U.S. Cl. 424—317 **14 Claims**

1. A pharmaceutical composition suitable for oral administration comprising a pharmaceutically acceptable carrier and an effective blood sugar lowering amount of an oral hypoglycemic agent, said agent being a compound selected from the group consisting of carboxylic acids of the formula:



and the lower alkyl esters and unsubstituted amide derivatives thereof, and the base salts of said acids with pharmacologically acceptable cations, wherein

W is $—CH_2—$ or $—CH(CH_3)—$;

X is hydrogen or lower alkyl; and

X^1 is hydrogen, lower alkyl, lower alkoxy or lower phenylalkoxy, with the proviso that when X^1 is other than lower alkyl, X is hydrogen.

4,374,149
α-{[(ARYLALKYL)AMINO]ALKYL}-4-HYDROXY-3-(LOWER-ALKYLSULFINYL)BENZENEMETHANOLS

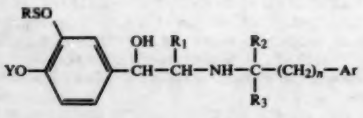
Richard E. Philion, Sand Lake, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 803,372, Jun. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 699,856, Jun. 25, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 937,928

Int. Cl.³ A01N *33/02*

U.S. Cl. 424—330 **24 Claims**

1. A compound having the formula



wherein:

R_1, R_2 and R_3 are independently hydrogen or lower alkyl;

n is an integer from 1 to 3;

Ar is phenyl, methylenedioxyphenyl or phenyl having from one to three substituents selected from the group consisting of halo, lower alkyl, hydroxy and lower alkoxy;

R is lower alkyl;

Y is hydrogen, lower alkyl, lower alkoxy-lower alkyl, lower alkanoyl, aroyl, benzenesulfonyl or toluenesulfonyl;

or an acid-addition salt thereof.

4,374,150
UREA YEAST FOOD FOR BAKING

Richard G. Harrell, Garland; Herman L. Glover, Carrollton, and Gary L. Cain, Dallas, all of Tex., assignors to Cain Food Industries, Inc., Dallas, Tex.

Filed Jun. 23, 1980, Ser. No. 161,884

Int. Cl.³ A21D *2/24;* **C12N** *1/16*

U.S. Cl. 426—19 **7 Claims**

1. In a method of baking yeast leavened bakery products wherein dough is admixed with yeast, the dough is allowed to ferment, followed by the baking of the dough, the improvement comprising the addition of an amount of urea of from about 5 to about 400 weight parts per million weight parts of flour utilized to form the dough.

4,374,151
FROZEN DOUGH FOR BAKERY PRODUCTS

Ted R. Lindstrom, Tarrytown, and Louise Slade, Bedford Hills, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,911

Int. Cl.³ A21D *13/00*

U.S. Cl. 426—19 **15 Claims**

1. A method of producing a frozen, leavened bread dough which is suitable for immediate baking when taken from the freezer comprising the steps of mixing bread forming ingredients including a leavening agent, fermenting said ingredients to produce a dough product, forming and resting the same, homogenously mixing in the dough, prior to forming and resting, an exogenous quantity of a water-soluble, melting-point depressant selected from a group consisting of C_1–C_3 monohydric alcohols, C_2 to C_4 polyhydric alcohols or combinations thereof such that the final concentration of melting-point depressant in the dough is from about 5% up to about 20% with respect to the weight of water contained in the dough freezing said dough product, whereby said melting-point depressant allows said frozen dough product to when placed in an oven quickly soften as oven temperature rises.

4,374,152
PROCESS FOR PREPARING ACID CHEESE CURD

Ira Loter, St. Louis, Mo., assignor to Mallinckrodt International Corp., St. Louis, Mo.

Continuation of Ser. No. 53,921, Jul. 2, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 223,125

Int. Cl.³ A23C *19/02, 19/05*

U.S. Cl. 426—39 **35 Claims**

1. An acid cheese curd making process comprising:

A. adding from about 0.1 to about 0.8 parts by weight of acid salt and from about 0.01 parts to about 0.05 parts by weight of proteolytic enzyme per 100 parts by weight of acidified milk to an acidified milk having a pH of from about 4.8 to about 5.5 without coagulation at a temperature of from about 75° F. to about 95° F.; and thereafter

B. allowing the acidified milk from (A) to remain quiescent at a temperature of from about 75° F. to about 95° F. for from about 30 minutes to about 4 hours to form an acid cheese curd suitable for making cottage cheese, baker's cheese, quark cheese, cream cheese and Neufchatel cheese.

5. An acid cheese curd making process comprising:

A. acidifying milk under vigorous agitation at about 32° F. to about 95° F. with a sufficient amount of an acid salt per

100 parts by weight of milk to obtain an acidified milk having a pH of from about 4.8 to about 5.5 without coagulation; then

B. adjusting the acidified milk to a temperature of from about 75° F. to about 95° F.; then

C. maintaining the acidified milk at a temperature of from about 75° F. to about 95° F. and adding an acidogen and from about 0.01 parts to about 0.05 parts by weight of proteolytic enzyme per 100 parts by weight of the acidified milk; and thereafter

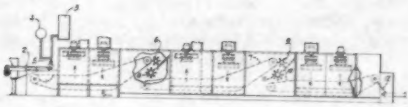
D. allowing the acidified milk from (C) to remain quiescent at a temperature of from about 75° F. to about 95° F. for from about 30 minutes to about 4 hours to form an acid cheese curd suitable for making cottage cheese, baker's cheese, quark cheese, cream cheese and Neufchatel cheese.

4,374,153

PROCESS FOR CONTROLLING THE PINKING OF ONIONS

Harry A. Andonian, Levittown, and Warren A. Dickinson, Jr., Glenside, both of Pa., assignors to SCM Corporation, New York, N.Y.

Filed Apr. 1, 1981, Ser. No. 250,007
Int. Cl.³ A23B 7/02; A23L 1/22
U.S. Cl. 426—321 **11 Claims**



1. A process for dehydrating cut onion pieces and inhibiting the production of pink color in said onion pieces, which comprises the steps of:

drying the onion pieces in a first drying stage;

contacting said onion pieces with a base before or at an initial point in said drying, the amount of base being an effective amount for inhibiting the production of pink color, and

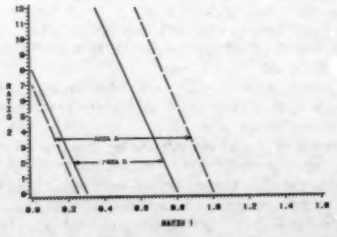
continuing the drying of said onion pieces in the presence of said effective amount of base until the moisture content of said onions is reduced to not substantially greater than about 60% Bone Dry Basis.

4,374,154

SOFT, FROZEN DESSERT FORMULATION

Bruce A. Cole, Tarrytown; Harold I. Levine, Monsey; Michael T. McGuire, Elmhurst; Kathleen J. Nelson, Peekskill, and Louise Slade, Monsey, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,168
Int. Cl.³ A23G 9/00
U.S. Cl. 426—565 **7 Claims**



1. A frozen, aerated dessert product which is extrudable by hand from a collapsible package at temperatures between 0° F. and 10° F., said product having an equilibrium melting temperature (T_m) between −3° C. and −10° C. and said product having a water content of from 45% to 63% by weight, a fat content of from 3% to 15% by weight, a protein content of from 2% to 10% by weight and a total carbohydrate level of from 24% to 34%, said carbohydrate level including amounts of monosaccharides, disaccharide and higher saccharides such that the ratio of higher saccharides to mono- and disaccharides (Ratio 1) and the ratio of disaccharides to monosaccharides (Ratio 2) satisfy the relationship of $7 \leq (28 \times \text{Ratio 1}) + \text{Ratio 2} \leq 28$.

4,374,155

YOGURT MILK SHAKE

Robert S. Igoe, and Richard J. Taylor, both of San Diego, Calif., assignors to Merck & Co. Inc., Rahway, N.J.

Filed Mar. 2, 1981, Ser. No. 239,747
Int. Cl.³ A23C 9/13, 9/137, 23/00
U.S. Cl. 426—569 **7 Claims**

1. A yogurt milk shake composition comprising:

(a) 73 to 99.45wt.% of yogurt and milk in the range yogurt:milk 80:20 to 53:47;

(b) 0.5 to 2.5 wt. % of a soya protein whipping agent; and

(c) 0.05% to 0.5 wt. % of a stabilizer which consists essentially of CMC and xanthan gum.

4,374,156

METHOD FOR OBTAINING A COATING OF A PREFERRED COMPOSITION ON A SURFACE OF A GLASS SUBSTRATE

Sandy T. S. Vong, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 30, 1981, Ser. No. 325,624
Int. Cl.³ B05D 1/12, 3/00; C03C 17/23
U.S. Cl. 427—8 **4 Claims**

1. A method for obtaining a preferred multi-component metallic oxide coating on a surface of a glass substrate by pyrolytic coating techniques in which a heat decomposable, non-homogeneous, dry powder mixture of organic based metallic salts are sprayed against said surface of said glass substrate while said surface is a temperature of at a range from 700° F. to 1200° F., which method comprises the steps of:

selecting a preferred composition for a multi-component metallic oxide coating for said surface of said glass substrate;

forming a plurality of testing samples of said non-homogeneous, dry powder mixture, each sample having a different composition of said multi-component organic based metallic salts;

spraying under identical condition individual test specimens of glass substrates with individual test samples of said dry powder mixture, thereby to form a plurality of coated test specimens, each coated test specimen having a different composition of a metallic oxide coating thereon;

analyzing each of said coated test specimens to determine the chemical composition of said coating thereon;

determining which coated test specimen has a coating thereon of said preferred composition; and

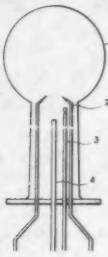
spraying commercial quantities of glass under the same spraying conditions used to spray said test specimens, said commercial spraying being carried out with the dry powder mixture having the composition which produced said preferred composition on said coated test specimen.

4,374,157

PROCESS FOR GASEOUSLY OPALIZING BULBS

Jean-Paul Barbier, Fontenay-le-Fleury, and Gilbert Lerouyer, Orgerus, both of France, assignors to L'Air Liquide, Paris, France

Filed Aug. 28, 1981, Ser. No. 297,366
Claims priority, application France, Sep. 10, 1980, 80 19503
Int. Cl.³ B05D 3/04, 7/22; C03C 17/345
U.S. Cl. 427—37 10 Claims



1. A process of gaseously opalizing a bulb comprising forming and depositing silica on the inside of the bulb by idation of silane with oxygen by means of an electric arc, said silane being diluted to a concentration of 0.1 to 3% by volume in a gas inert in regard to the silane.

4,374,158

PROCESS FOR PRODUCING TRANSPARENT SHAPED ARTICLE HAVING ENHANCED ANTI-REFLECTIVE EFFECT

Takashi Taniguchi, Shiga, and Jiro Mibae, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,346
Claims priority, application Japan, Nov. 14, 1979, 54-146485; Sep. 4, 1980, 55-121745
Int. Cl.³ B05D 3/14
U.S. Cl. 427—41 19 Claims

1. A process for producing a transparent shaped article having an enhanced anti-reflective effect, said article either being an organic material or having a coating of organic material thereon which comprises treating with an activated gas the surface of a transparent shaped article, said surface layer comprising a finely divided particulate inorganic substance having an average particle size of from about 1 to about 300 millimicrons dispersed in said organic material.

4,374,159

FABRICATION OF FILM CIRCUITS HAVING A THICK FILM CROSSUNDER AND A THIN FILM CAPACITOR

Raymond C. Pitetti, Wescosville, and John Rutkiewicz, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 27, 1981, Ser. No. 287,418
Int. Cl.³ H05K 3/12
U.S. Cl. 427—96 13 Claims

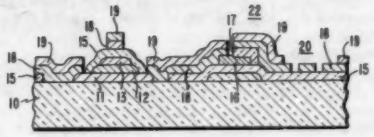
1. A method of fabricating a film circuit on an insulating substrate (10) comprising the steps of:

forming a thick film electrode (11) on one portion of said substrate;

depositing and firing at least one dielectric layer (12) on a portion of said electrode and depositing and firing at least one layer capable of smoothing irregularities of the substrate on a portion of the substrate remote from said electrode where a capacitor (22) is to be formed, the firing of each such layer being such as not to melt a previously deposited layer;

subsequent to formation of said layers forming a first metal layer (14) over essentially the entire substrate including said layers and said thick film electrode;

removing a portion of said metal layer from an area (21) of the thick film electrode to accommodate an electrical contact thereto;



oxidizing the metal layer to form a protective oxide layer (15); and

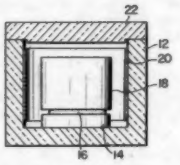
forming over said oxide layer at least one thin film capacitor (22), and a thin film conductor (19) electrically coupled to the thick film electrode.

4,374,160

METHOD OF MAKING A NON-LINEAR VOLTAGE-DEPENDENT RESISTOR

Nobuyuki Yoshioka, Fujisawa; Tsutai Suzuki, Tokyo; Masanori Haba, Kashiwa, and Hideo Koyama, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 245,147
Int. Cl.³ B05D 5/12; H01C 7/10
U.S. Cl. 427—101 23 Claims



1. A method of making a non-linear voltage-dependent resistor containing a ZnO element including zinc oxide as its major component wherein the improvement comprises the step of forming a layer comprised of high insulating material due to a vapor-solid reaction in an atmosphere of a vaporizable molecular compound which reacts with the zinc oxide at a sintering temperature.

4,374,161

PRESSURE COATING OF FIBERS

Franz T. Geyling, Morristown, and Theodore J. Louzon, Bridgewater, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1981, Ser. No. 257,354
Int. Cl.³ B05D 1/18, 7/20; G02B 1/10, 5/14
U.S. Cl. 427—160 6 Claims

1. A method of making a coated fiber by steps comprising applying a coating layer to a bare fiber or to an intermediate coated layer thereon,

characterized in that said coating layer is applied by directing under pressure a fluid coating material substantially radially inward towards said fiber while said fiber passes through a passage in a chamber, with the substantially radial flow of coating fluid being maintained over a length of the fiber of at least 0.5 inches, wherein said pressure is sufficient to prevent the meniscus of said fluid from sub-

stantially extending into said passage, and wherein the diameter of said passage is sufficiently large to substantially prevent said fiber from contacting the sides of said passage.

4,374,162

THIN-FILM DEPOSITION

Toshinori Takagi, Nagaokakyo, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Chiba, Japan

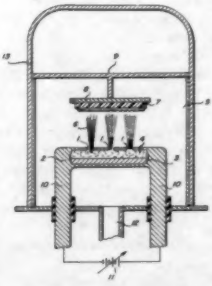
Continuation of Ser. No. 705,512, Jul. 14, 1976, abandoned. This application Apr. 15, 1980, Ser. No. 140,596

Claims priority, application Japan, Jul. 15, 1975, 50-86974

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.³ C23C 13/00

U.S. Cl. 427—248.1 **6 Claims**



1. A film deposition method comprising the steps of:

heating and vaporizing a material within a crucible of the sealed type having one or more ejection nozzles;

ejecting the resulting vapor of the material via the ejection nozzles to a vacuum region such that atom aggregates or clusters tied by van der Waals force are formed through an adiabatic expansion to attain a supercooled state, the vacuum region adapted to accommodate a substrate therein;

maintaining a vapor pressure in the vacuum region such that vapor particles of the material advance toward the substrate without collision with residual gas particles or the like within the vacuum region;

depositing said clusters of atomic particles on said substrate, wherein said clusters are broken up upon striking the substrate which contributes to growth of the deposition due to migration of the material particles; and

controlling the ejection velocity by varying the heating temperature of said crucible and varying the pressure differential between the pressure in said crucible and the pressure in said vacuum region for the purpose of controlling fine structures of films deposited onto the substrate wherein kinetic energy obtained during the ejection step, which has an important effect upon the fine structures of the deposited films, is controllable within a wide range.

4,374,163

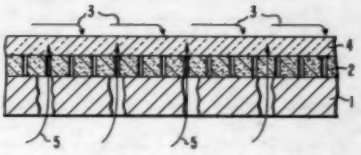
METHOD OF VAPOR DEPOSITION

Arnold O. Isenberg, Forest Hills Boro., Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1981, Ser. No. 307,139

Int. Cl.³ C23C 11/00

U.S. Cl. 427—253 **12 Claims**



1. A method of forming a dense layer of a polycrystalline metal M according to the reaction

$$MX_n + mR \rightarrow M + mRX_{\frac{n}{m}}$$

where M is selected from the group consisting of elements of periodic table groups III, IV, and V and mixtures thereof, each X is independently selected from the group consisting of chlorine, bromine, and iodine, R is selected from the group consisting of hydrogen, elements of periodic table groups I and II to atomic number 30, and mixtures thereof, n is the valence of M, and m is n/valence of R, comprising

(A) heating an inert substrate which separates said mR from said MX_n and which is permeable by said mR, to a temperature high enough to vaporize said

$$mRX_{\frac{n}{m}},$$

(B) heating said mR on one side of said substrate sufficiently to diffuse it through said substrate; and

(C) heating said MX_n on the other side of said substrate sufficiently to vaporize it.

4,374,164

HIGH SOLIDS POLYMER RESIN COATING COMPOSITION CONTAINING AMINO RESIN CROSS-LINKING AGENT

Werner J. Blank, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 14, 1981, Ser. No. 330,422

Int. Cl.³ B05D 3/02

U.S. Cl. 427—385.5 **13 Claims**

1. A high solids polymer resin coating composition possessing improved intercoat adhesion comprising a low molecular weight resin selected from the group consisting of acrylic resin, polyester resin and mixtures thereof and a predominantly monomeric poly(methoxy isobutoxy methyl) melamine resin cross-linking agent.

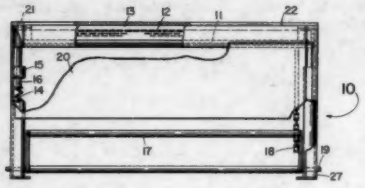
13. A process of coating a substrate by application of a high solids polymer resin coating composition, curing of the compo-

sition and recoating with the same high solids polymer resin coating composition, the improvement providing a coating of improved intercoat adhesion therein wherein the coating composition is one as claimed in claims 1, 2, 3, 7, 8, 9, 11 or 12.

4,374,165
LIQUID ADHESIVE APPLICATOR

John L. Mortoly, Poughkeepsie, N.Y., assignor to James L. Taylor Mfg. Co., Poughkeepsie, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,227
Int. Cl.³ B05D 1/18; C09J 5/02; B05G 1/00
U.S. Cl. 427—430.1 12 Claims



8. A method of applying liquid adhesive to a work-piece comprising the steps of:

immersing a stationary support member in a reservoir containing a liquid adhesive;

moving the reservoir relative to the support member to expose the same;

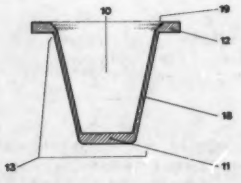
allowing excess liquid adhesive to drain through the apertures in the support member, and;

thereafter placing the work-piece in contact with the support member to apply adhesive thereto.

4,374,166
AMORPHOUS, DRAWN, CUP-LIKE THERMOPLASTIC PET ELEMENT OF 10–25% CRYSTALLINITY AND MONOAXIAL ORIENTATION IN SIDE WALL

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Löddeköpinge, both of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Filed May 30, 1980, Ser. No. 154,889
Claims priority, application Sweden, Jun. 11, 1979, 7905042
Int. Cl.³ B65D 00/00
U.S. Cl. 428—35 16 Claims



1. An element formed from a blank of amorphous PET having a crystallinity of less than 10%, said element comprising an annular edge part and a depressed portion extending from said edge part and surrounded by said edge part, said depressed portion being of cup-like shape, said edge part forming a rim for said depressed portion of cup-like shape, said edge part consisting of substantially undrawn, amorphous, PET having a crystallinity of less than 10%, said depressed portion including an annular wall portion of uniform thickness consisting of PET drawn at an initial temperature below Tg and having one-third the thickness of the amorphous blank and undergone material flow to provide crystallinity of between 10 and 25% with a monoaxial orientation, said annular wall portion having a smaller thickness than said annular edge part.

4,374,167
VAPOR PERMEATION CURABLE POLYESTER RESIN COATING COMPOSITIONS FOR FLEXIBLE SUBSTRATES

James R. Blegen, Worthington, Ohio, assignor to Ashland Oil, Inc., Dublin, Ohio

Division of Ser. No. 216,323, Dec. 15, 1980, Pat. No. 4,343,839.
This application Apr. 5, 1982, Ser. No. 365,603
Int. Cl.³ B32B 3/26, 27/40; C08G 18/42; B05D 3/10
U.S. Cl. 428—141 14 Claims

1. A composite article comprising a flexible substrate having an adherent cured film of a curable coating composition thereon, said film at a thickness of between about 0.1 and 0.5 mils possessing a flexibility sufficient for a O-T bend on metal and a mar resistance of at least about 2000 gms as borne by the edge of a nickel passed over said cured film, said film being the cured residue of said coating composition after exposure to a vaporous tertiary amine catalyst, said coating composition comprising:

(A) an aromatic hydroxyl-functional condensation product having an acid number of less than about 10 and made by condensing the following ingredients in the indicated molar proportions or double thereof except for the phenolic-functional carboxylic acid:

(1) between about 1 and 2 moles of a C_2–C_{12} linear aliphatic dibasic acid,

(2) between about 1 and 2 moles of an ortho or meta aromatic dicarboxylic acid or anhydride thereof,

(3) between about 1 and 4 moles of a C_2–C_6 alkylene glycol,

(4) between about 1 and 2 moles of a sterically hindered diol,

(5) between about 1 and 2 moles of a mono-epoxide or diol having a pendant C_8–C_{22} hydrocarbyl group, and

(6) between about 1 and 2 moles of a phenolic-functional carboxylic acid;

(B) a multi-isocyanate comprising:

(1) between about 10 and 80 percent by weight of an aromatic multi-isocyanate, and

(2) between about 90 and 20 percent by weight of an aliphatic multi-isocyanate;

(C) a volatile oganic solvent for such condensation product and for said multi-isocyanate, and

(D) a mar-resisting agent of an organic compound physically incompatible in said coating composition and having an effective chain length of at least about 12 carbon atoms;

the ratio of aromatic hydroxyl equivalents of said condensation product to the isocyanate equivalents of said multi-isocyanate being between about 1:1 and 1:1.7, said condensation product containing substantially no aliphatic hydroxyl groups, and said condensation product having a phenol functionality of at least 2.

9. A flexible coated substrated prepared by the method which comprises:

(I) applying said coating composition to said flexible substrate, said coating composition having a pot life of at least about 4 hours in an open pot and comprising:

(A) an aromatic hydroxyl-functional condensation product having an acid number of less than about 10, having an aromatic hydroxyl-functionality of at least 2, and containing substantially no aliphatic hydroxyl groups, said condensation product made by condensing the following ingredients in the indicated molar proportions or double thereof except for the phenol-functional carboxylic acid:

(1) between about 3 and 8 moles of a mixture of diols which include a sterically hindered diol, and a diol or mono-epoxide which provides a pendant C_8–C_{22} hydrocarbyl group; and

(2) between about 3 and 6 moles of a mixture of a linear

aliphatic dibasic acid and an ortho or meta aromatic dicarboxylic acid, and a phenol-functional carboxylic acid having at least one carbon atom between said phenol group and said carboxyl group;

(B) a multi-isocyanate cross-linking agent comprising a mixture of between about 10% and 80% by weight of an aromatic multi-isocyanate and between about 90% and 20% by weight of an aliphatic multi-isocyanate, wherein the ratio of aromatic hydroxyl equivalents from said condensation product to the isocyanate equivalents of said multi-isocyanate ranges from between about 1:1 and 1:1.7;

(C) a volatile organic solvent for said condensation product and for said multi-isocyanate; and

(D) a mar-resisting agent of an organic long chain fatty compound physically incompatible in said coating composition and having an effective chain length of at least 12 carbon atoms;

(II) exposing said coated flexible substrate to a vaporous tertiary amine catalyst to rapidly cure said coating at about room temperature;

said cured coating having a film thickness of between about 0.1 and about 0.5 mils;

said cured film of said coating composition possessing a flexibility sufficient for a zero-T bend on metal and a mar resistance of at least about 2,000 grams as borne by the edge of a nickel passed over said cured film.

12. The flexible coated substrate of claim 9 or 11 wherein said cured film on said flexible coated substrate is heat-embossed.

4,374,168

METALWORKING LUBRICATION

Wesley J. Wojtowicz, Fraser, Mich., assignor to The H. A. Montgomery Co., Inc., Detroit, Mich.

Filed Nov. 6, 1981, Ser. No. 318,849

Int. Cl.³ B32B *7/02*; B05D *1/18*; B21B *45/02*; B32B *15/04*

U.S. Cl. 428—212 **19 Claims**

7. A sheet metal workpiece which is to be subsequently worked to fabricate articles therefrom including a metal surface having applied thereto a layer of a metalworking lubricant composition, said metalworking lubricant composition consisting essentially of a dispersion of from about 2 to about 20 parts by weight of a liquid polar lubricant having a viscosity of at least 1,000 cSt at 20° C. constituting a discontinuous phase in 100 parts of an anhydrous hydrocarbon liquid vehicle having a viscosity no higher than 100 cSt at 20° C., said hydrocarbon liquid vehicle being one in which said polar lubricant is normally substantially insoluble and immiscible, said dispersion containing at least one emulsifying agent in a total amount sufficient to stabilize the dispersion for application to a metal surface but insufficient to prevent separation of the discontinuous phase from said vehicle upon application of the dispersion to a metal surface as a layer having a thickness up to about 500 microinch.

4,374,169

ABRASION RESISTANT, REINFORCED SCREEN PANEL MEMBER

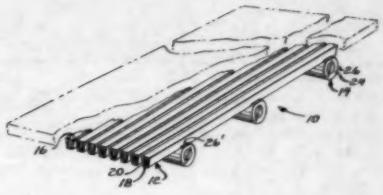
Gregory A. Gryskiewicz, North St. Paul, and Raymond A. Koehler, Anoka, both of Minn., assignors to UOP Inc., Des Plains, Ill.

Filed Sep. 14, 1981, Ser. No. 301,546

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—221 **13 Claims**

1. A reinforced, abrasion resistant screen member for use in either a vibrating or non-vibrating type screen apparatus comprising a first plurality of closely spaced elongated profiled surface wires arranged parallel to each other and in a plane so as to define elongated slots between the wires which have a width less than the width of the wires, each of said first plurality of wires including a rigid core portion having a flexural modulus of elasticity of at least 100,000 p.s.i. and a layer of a less rigid thermoplastic, abrasion resistant material extruded over it and in intimate bonded relationship to it; a second plurality of less closely spaced elongated support rods positioned in a plane and arranged parallel to each other and transverse to said first plurality of wires, each of said second plurality of support rods including a rigid core portion having a flexural modulus of elasticity of at least 100,000 p.s.i. and a layer of a less rigid thermoplastic, abrasion resistant material



extruded over it and in intimate bonded relationship to it, said first plurality of wires and said second plurality of rods having portions of their layers of thermoplastic abrasion resistant material fused together in overlapping relationship at every intersection, the cores of said wires and rods being unfused and spaced from each other at every intersection, and the dimension of the open spaces between adjacent screen rods being at least 10 times the width dimension of the slots defined by the surface wires.

4,374,170

ROOM TEMPERATURE CURE POLYESTER LAMINATES

Donald G. Fesko, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 9, 1981, Ser. No. 319,535

Int. Cl.³ D03D *3/00*

U.S. Cl. 428—224 **50 Claims**

1. A composition of matter comprising the product of an amassment of

(A) a first array of filaments impregnated with a first resin system comprising (a) thermosetting resin, (b) first curing agent for said resin and (c) first accelerator that is effective to promote a second curing agent for said resin and is substantially ineffective to promote said first curing agent; and

(B) a second array of filaments impregnated with a second resin system comprising (d) said resin, (e) said second curing agent and (f) second accelerator that is effective to promote said first curing agent and is substantially ineffective to promote said second curing agent;

wherein said amassment provides substantial contact, one array with the other.

4,374,171

SMOLDER AND FLAME RESISTANT INSULATION MATERIALS, COMPOSITION AND METHOD

Robert J. McCarter, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Continuation-in-part of Ser. No. 51,922, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 870,385, Jan. 18, 1978, abandoned. This application Oct. 19, 1981, Ser. No. 313,045

Int. Cl.³ D04H *1/58*

U.S. Cl. 428—288 **35 Claims**

1. A flame and smolder resistant cellulosic insulation material comprising:

a cellulosic fibrous mass of sufficiently low density to provide insulating effects,

from about 2% to about 9% elemental sulfur based on the weight of the cellulosic fibrous mass, and

from about 10% to about 25% flame retardant based on the weight of the cellulosic fibrous mass.

4,374,172

SOUND INSULATING MATERIAL

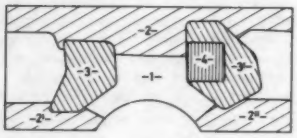
Herwig. J. Schwarz, Walldorf; Hans-Jürgen H. Burde, Neckargemund-Waldhilsbach, and Günter Minet, Heidelberg, all of Fed. Rep. of Germany, assignors to Teroson GmbH, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 968,872, Dec. 12, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 182,543

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2756622

Int. Cl.³ B32B *5/14, 5/18, 5/22, 7/02*

U.S. Cl. 428—308.4 **8 Claims**



1. A sound insulating material for application to structures to be acoustically insulated, which structures possess areas oscillating at differing frequencies and therefore present differing acoustic requirements, said insulating material consisting of a single, non-laminated layer of an open-pored foam or a layer of open-pored foam having a coating of textile material laminated to one or both surfaces thereof, said layer of foam being impregnated prior to application to said structures with a viscoelastic material so that said viscoelastic material penetrates the pores of the foam, said impregnation being in a non-uniform manner across at least one surface of said foam such that the quantity of said viscoelastic material across said surface varies in accordance with said differing acoustic requirements of said structures, said non-uniform impregnation further being in a planned manner such that upon application to said structures, the areas of said foam containing the greater quantities of said viscoelastic material correspond to the areas of said structures requiring greater sound damping, said viscoelastic material impregnating compound having different chemical compositions in individual areas in and on the surface of said foam.

4,374,173

COMPOSITE POWDERS SPRAYABLE TO FORM ABRADABLE SEAL COATINGS

Emilija Adamovic, Willowdale, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

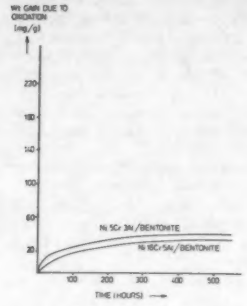
Division of Ser. No. 91,870, Nov. 6, 1979, Pat. No. 4,291,089. This application Dec. 4, 1980, Ser. No. 212,781

The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.³ B05D *1/10;* **B32B** *5/16*

U.S. Cl. 428—325 **22 Claims**

1. A composite powder sprayable by thermal spraying onto a substrate to form an abradable seal coating, said powder comprising particles each having a core of non-metallic solid material surrounded by a layer of nickel-chromium-aluminum



alloy containing from about 4 to about 8% by weight chromium and from about 2 to about 6% by weight aluminum.

4,374,174

COMPOSITION AND SHEET MATERIALS FOR INHIBITING CORROSION OF METALS

Hazel R. Stricklin, and George W. Morrow, Jr., both of Cullman, Ala., assignors to Daubert Industries, Inc., Oak Brook, Ill.

Filed Feb. 12, 1981, Ser. No. 234,092

Int. Cl.³ B32B *15/10, 15/12;* **B65B** *11/00*

U.S. Cl. 428—341 **16 Claims**

7. An article of manufacture which acts as a contact and a vapor phase inhibitor for inhibiting the corrosion of metals comprising a solid carrier in sheet form having incorporated therein as an essential active ingredient an alkali metal salt of sorbic acid.

9. An article according to claim 7 wherein the active ingredient is present in a concentration of from about 0.1 to about 10 grams per square foot of surface area of the solid carrier.

4,374,175

NOVEL WATER-SWELLABLE FIBERS AND PROCESS FOR PRODUCING THE SAME

Koji Tanaka, Okayama, Japan, assignor to Japan Exlan Co., Ltd., Osaka, Japan

Division of Ser. No. 87,951, Oct. 24, 1979, abandoned. This application May 21, 1981, Ser. No. 266,055

Claims priority, application Japan, Jan. 16, 1979, 54/4277

The portion of the term of this patent subsequent to Nov. 6, 1999, has been disclaimed.

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—369 **6 Claims**

1. Water-swellable acrylonitrile polymer fibers which contain salt-type carboxyl groups represented by the formula —COOX wherein X is an alkali-metal or NH_4 in an amount of from 0.1 to 4.0 mol/g, and which are produced by treating acrylonitrile polymer fibers having latent or visualized crimps with (a) an aqueous alkali-metal hydroxide solution of a high concentration not less than 6.0 mol/1000 g solution or (b) an aqueous alkali-metal hydroxide solution of a low concentration coexisting with an electrolytic salt of a concentration not less than 0.5 mol/1000 g solution thus rendering the outer layer portion of said fibers hydrophilic and cross-linked, wherein at least a part of the fiber outer layer portion is composed of a hydrogel and the remainder is composed of an acrylonitrile polymer and/or another polymer, the resultant fibers having latent or visualized crimps and combining a high degree of water-swellability of 3 to 300 cc/g with excellent physical properties.

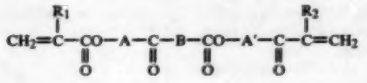
4,374,176

MODIFIER FOR FIBERS OR FIBROUS STRUCTURES AND MODIFIED FIBERS OR FIBROUS STRUCTURES

Kiyoshi Aoki, Osaka, and Saburo Ohara, Kyoto, both of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Synthetic Fibers Ltd., Osaka, both of, Japan

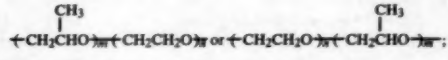
Division of Ser. No. 161,717, Jun. 20, 1980, Pat. No. 4,309,560. This application Sep. 25, 1981, Ser. No. 305,419
Claims priority, application Japan, Nov. 26, 1979, 54/153268
Int. Cl.³ D02G 3/00
U.S. Cl. 428—392 17 Claims

1. Modified fibers or fibrous structures obtained by applying to fibers or fibrous structures a treating liquid, which contains a compound represented by the general formula (I)

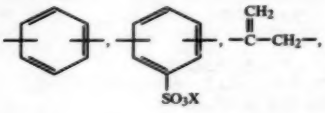


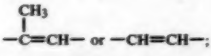
(I)

wherein R_1 and R_2 represents H or CH_3; A and A′ represent



B represents





X represents H, NH_4 or an alkali metal; and m and n represent numerals determined by the following formulae, $0 \leqq m \leqq 25$, $5 \leqq n \leqq 50$ and $5 \leqq (m+n) \leqq 50$, and heat treating the above treated fibers or fibrous structures, the amount of said compound adhering to the fibers or fibrous structure being at least 0.5% by weight based on the weight of the fibers.

4,374,177

AQUEOUS SIZING COMPOSITION FOR GLASS FIBERS AND SIZED GLASS FIBERS FOR THERMOPLASTIC REINFORCEMENT

Ed C. Hsu, Pittsburgh; L. Dow Moore, Allison Park, and Chester S. Temple, McKees Rocks, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,203
Int. Cl.³ B32B 9/00
U.S. Cl. 428—392 28 Claims

1. An aqueous sizing composition for glass fibers used for reinforcing polymers, comprising:

a. a polyurethane polymer,

b. a epoxy polymer,

c. a polyethylene-containing polymer,

d. wax where the weight ratio of the polyethylene-containing polymer to wax is in the range of about 25 to 1 to about 1 to 25, and

e. an amino silane coupling agent, and

f. water in an amount to give a total solids content for the composition in the range of about 1 to about 30 weight percent.

4,374,178

SILANATED CALCIUM CARBONATE FILLERS

Ravindra D. Kulkarni, Milpitas, Calif., and Errol D. Goodard, Haworth, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 29, 1980, Ser. No. 220,280
Int. Cl.³ B32B 5/16
U.S. Cl. 428—404 2 Claims

1. A calcium carbonate filler composition which comprises a mixture of

(I) particulate calcium carbonate,

(II) sodium silicate, and

(III) a silane having the formula

$$R(R^1)_aSi(X)_{3-a}$$

wherein R which contains a carbon atom directly bonded to the silicon atom of the above formula represents an organic radical, R^1 represents a radical selected from the group consisting of R and monovalent hydrocarbon radicals, a has a value of 0 or 1, and X represents a hydrolyzable group, the hydrolyzates of said silanes, the condensates of said silanes, and mixtures thereof,

which composition has been heated to a temperature in the range 100° C. to 140° C. for a period of time in the range one to eight hours.

4,374,179

PLASMA POLYMERIZED ETHANE FOR INTERLAYER DIELECTRIC

Jacob W. Lin, Bloomington, and Leslie S. Weinman, Eden Prairie, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 18, 1980, Ser. No. 217,645
Int. Cl.³ B32B 9/04, 27/32; B05D 3/06
U.S. Cl. 428—411 9 Claims

1. A multilyer solid state device which comprises:

a substrate;

a conductive area deposited on said substrate; and,

a dielectric layer of plasma polymerized ethane (PPE) deposited over said conductive area.

4,374,180

METHOD FOR MODIFICATION OF THE SURFACE OF INDUSTRIAL RUBBER ARTICLES

Rudolf A. Gorelik, ulitsa Sumskaya, 6, korpus 4, kv. 2; Evgeny A. Dukhovskoi, prospekt Vernadskogo, 127, kv. 467; Alexandr M. Kleiman, naberezhnaya M.Gorkogo, 40/42, kv. 244; Nikolai A. Kleimenov, Leninsky prospekt, 57, kv. 125; Andrei M. Markevich, ulitsa Vavilova, 55/7, kv. 15, all of Moscow; Ardalion N. Ponomarev, ulitsa Tretia, 2, kv. 3, Moskovskaya oblast, Noginsky raion, p/o Chernogolovka; Askold A. Silin, prospekt Vernadskogo, 93, kv. 95, Moscow; Valentina M. Skok, prospekt Vernadskogo, 93, kv. 94, Moscow; Viktor L. Talroze, Vorobievskoe shosse, 11, kv. 21, Moscow; Anatoly V. Khomyakov, ulitsa Studencheskaya, 30, stroenie 2, kv. 2, Moscow, and Andrei Y. Lyapunov, ulitsa Dmitria Ulyanova, 1/61, kv. 141, Moscow, all of U.S.S.R.

Filed Sep. 25, 1980, Ser. No. 190,798
Claims priority, application U.S.S.R., Sep. 25, 1979, 2810498
Int. Cl.³ B05D 3/06
U.S. Cl. 428—421 6 Claims

1. A method for modifying the surface of industrial rubber articles to reduce the coefficient of friction comprising the sequential steps of:

placing said articles into a vacuum chamber and treating them at a residual air pressure below 1 Pa, in the presence of ionizing radiation in the form of an electric glow discharge created in said vacuum chamber; and then

contacting the surface of said industrial rubber articles with a polymer layer by admitting into said chamber, vapors of an ester of methacrylic acid or acrylic acid, and a fluori-

nated alcohol at a pressure in the chamber ranging from 10 to 10,000 Pa simultaneously with the treatment of said articles in said electric glow discharge for a period of about 0.5 to 2 hours.

4,374,181

VAPOR PERMEATION CURABLE COATINGS FOR REACTION INJECTION MOLDED PARTS

James R. Blegen, Worthington, Ohio, assignor to Ashland Oil, Inc., Dublin, Ohio

Filed Sep. 14, 1981, Ser. No. 302,185
Int. Cl.³ B05D *3/10*
U.S. Cl. 428—423.3 **32 Claims**

1. A coating composition rapidly curable at room temperature in the presence of vaporous tertiary amine catalyst and possessing a pot life of at least about 4 hours in an open pot, comprising:

(1) an aromatic hydroxyl-functional condensation product made by condensing the following ingredients:

(a) a linear aliphatic dibasic acid;

(b) a linear aliphatic glycol,

where the sum of the methylene groups of (a) and (b) is between 10 and 13 and where up to about one-half of (a) or (b) can be replaced with a C_6–C_8 cycloaliphatic dibasic acid or diol;

(c) the combination of a linear aliphatic glycol and aromatic dicarboxylic acid, or a bis(hydroxyalkyl) adduct of an aromatic diol and a linear aliphatic dicarboxylic acid,

(d) a phenol capping agent,

where said condensation product (1) has a molecular weight of between about 1,000 and 4,000 an equivalent (solids) weight of between about 250 and 1,000, and substantially no aliphatic hydroxyl groups;

(2) a multi-isocyanate curing agent;

(3) a volatile organic solvent for said aromatic hydroxyl-functional condensation product and for said multi-isocyanate curing agent,

the ratio of aromatic hydroxyl equivalents of said condensation product to the isocyanate equivalents of said multi-isocyanate being between about 1:1 and 1:2.

18. A method for coating a substrate with a film of a coating composition rapidly curable at room temperature in the presence of a vaporous tertiary amine catalyst and possessing a pot life of at least about 4 hours in an open pot, which comprises:

(A) applying a film of said coating composition to said substrate, said coating composition comprising:

(1) an aromatic hydroxyl-functional condensation product made by condensing the following ingredients:

(a) a linear aliphatic dibasic acid;

(b) a linear aliphatic glycol,

where the sum of the methylene groups of (a) and (b) is between 10 and 13 and where up to about one-half of (a) or (b) can be replaced with a C_6–C_8 cycloaliphatic dibasic acid or diol;

(c) the combination of a linear aliphatic glycol and aromatic dicarboxylic acid, or an aromatic diol and a linear aliphatic dicarboxylic acid,

(d) a phenol capping agent,

where said condensation product (1) has a molecular weight of between about 1,000 and 4,000, an equivalent (solids) weight of between about 250 and 1,000, and substantially no aliphatic hydroxyl groups;

(2) a multi-isocyanate curing agent;

(3) a volatile organic solvent for said aromatic hydroxyl-functional condensation product and for said multi-isocyanate curing agent,

the ratio of aromatic hydroxyl equivalents of said condensation product to the isocyanate equivalents of said multi-isocyanate being between about 1:1 and 1:2,

(B) exposing said coated substrate to a vaporous tertiary amine catalyst to rapidly cure said coating at about room temperature.

27. A composite article comprising a substrate selected from reaction injection molding urethane and upholstery vinyl having an adherent cured film of a curable coating composition thereon, said film at a thickness of between about 1 and 4 mils, said film being the cured residue of said coating composition after exposure to a vaporous tertiary amine catalyst, said coating composition comprising:

(1) an aromatic hydroxyl-functional condensation product made by condensing the following ingredients:

(a) a linear aliphatic dibasic acid;

(b) a linear aliphatic glycol,

where the sum of the methylene groups of (a) and (b) is between 10 and 13 and where up to about one-half of (a) or (b) can be replaced with a C_6–C_8 cycloaliphatic dibasic acid or diol;

(c) the combination of a linear aliphatic glycol and aromatic dicarboxylic acid, or a bis(hydroxyalkyl) adduct of an aromatic diol and a linear aliphatic dicarboxylic acid,

(d) a phenol capping agent,

where said condensation product (1) has a molecular weight of between about 1,000 and 4,000 an equivalent (solids) weight of between about 250 and 1,000, and substantially no aliphatic hydroxyl groups;

(2) a multi-isocyanate curing agent;

(3) a volatile organic solvent for said aromatic hydroxyl-functional condensation product and for said multi-isocyanate curing agent,

the ratio of aromatic hydroxyl equivalents of said condensation product to the isocyanate equivalents of said multi-isocyanate being between about 1:1 and 1:2.

4,374,182

PREPARATION OF SILICON METAL THROUGH POLYMER DEGRADATION

John H. Gaul, and Donald R. Weyenberg, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 7, 1980, Ser. No. 166,201
Int. Cl.³ B32B *9/00*; B05D *3/02*
U.S. Cl. 428—446 **7 Claims**

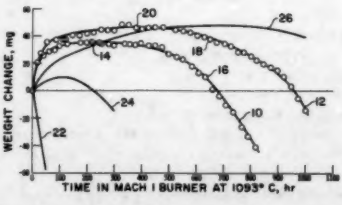
1. A method of preparing silicon consisting essentially of pyrolyzing a polychlorosilane, having a molecular weight greater than the molecular weight of Si_2Cl_6, in an inert atmosphere or in a vacuum, at a temperature of 500° C. to 1450° C.

4,374,183

SILICON-SLURRY/ALUMINIDE COATING

Daniel L. Deadmore, Middleburg Heights, and Stanley G. Young, North Olmsted, both of Ohio, assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 161,254, Jun. 20, 1980, Pat. No. 4,310,574.
This application Aug. 14, 1981, Ser. No. 293,418
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—641 **4 Claims**



1. A coated article of manufacture comprising:

a substrate of a nickel-base superalloy,

a layer of silicon having a purity of about 99.9% and a specific weight of 6 mg of silicon per square centimeter of surface area covering said substrate, and

an aluminide coating covering said silicon layer.

4,374,184

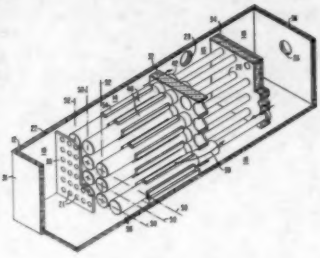
FUEL CELL GENERATOR AND METHOD OF OPERATING SAME

Edward V. Somers, Murrysville, and Arnold O. Isenberg, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1981, Ser. No. 306,810

Int. Cl.³ H01M 8/06

U.S. Cl. 429—17 **16 Claims**



1. A method of operating a fuel cell generator of the type having a plurality of interconnected, elongated, annular solid oxide fuel cells each including a porous anode and cathode wherein said anode of each said cell includes a catalytic material, said method comprising:

flowing an oxidant adjacent said cathode; and

flowing a reactant, reformable to at least one of hydrogen and carbon monoxide in the presence of said catalytic material, adjacent said anode.

4,374,185

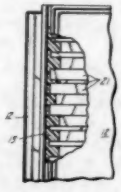
HIGH TEMPERATURE, HIGH PRESSURE CHEMICAL RESISTANT SEAL MATERIAL

Joseph Powers, Riverside; John C. Trocciola, Glastonbury, both of Conn., and Ronald G. Martin, Monson, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 14, 1981, Ser. No. 263,660

Int. Cl.³ H01M 2/08

U.S. Cl. 429—36 **3 Claims**



1. An electrochemical cell stack comprising a plurality of relatively flat electrochemical cells containing anodes, cathodes, electrolyte, and fuel and oxidant active catalysts, wherein fuel and oxidant gases are fed to or removed from the cell stack through plenums mounted on the cell stack,

the improvement comprising sealing the plenums to the cell stacks by application between the plenum and the cell stack of an extrudable seal material comprising an oil-free, filler-free polytetrafluoroethylene which maintains its sealing properties in the presence of phosphoric acid at differential pressures in excess of 50 psi at temperatures in excess of 400° F. (204° C.) having a molecular weight greater than 1×10^6 and a particle size greater than 1 micron.

4,374,186

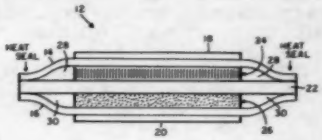
POLYMER PACKAGED CELL IN A SACK

Joseph F. McCartney, Solana Beach; Thomas E. Jones, Spring Valley, and Leopold J. Johnson, Valley Center, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1981, Ser. No. 258,838

Int. Cl.³ H01M 6/46

U.S. Cl. 429—154 **15 Claims**



1. A battery cell comprising:

a first layer of conductive polymer;

a layer of cathode material disposed in contact with said first layer of conductive polymer;

a layer of ion permeable, electrolyte impermeable insulating material disposed in contact with said layer of cathode material and in contact with said layer of conductive polymer so as to form a complete enclosure around said layer of cathode material;

a layer of anode material disposed in contact with said layer of ion permeable insulating material; and

a second layer of conductive polymer disposed in contact with said layer of anode material and in contact with said layer of ion permeable insulating material so as to form a complete enclosure around said layer of anode material.

4,374,187

COVER APPARATUS IN MONOBLOCK STORAGE BATTERY

Ichiro Sano, Yokohama, Japan, assignor to The Furukawa Battery Co., Ltd., Kanagawa, Japan

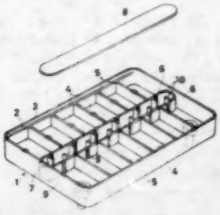
PCT No. PCT/JP78/00034, § 371 Date Nov. 1, 1979, § 102(e) Date Nov. 1, 1979

PCT Filed Dec. 1, 1978, Ser. No. 142,059

Claims priority, application Japan, Mar. 4, 1978, 53-26992[U]

Int. Cl.³ H01M 2/08

U.S. Cl. 429—175 **10 Claims**



1. A cover apparatus in a monoblock battery comprising a top wall having an underside surface, a plurality of cell partition walls depending from said top wall underside surface defining a plurality of cell chambers, mutually facing walls crossing said cell partition walls, a cover wall associated with said facing walls for defining on the underside of said top wall an exhaust duct common to said plurality of cell chambers, and said duct being formed with openings communicating with

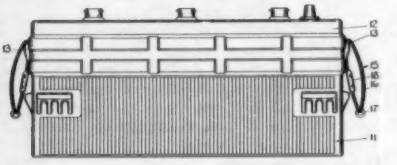
respective of said cell chambers whereby exhaust gas generated in the cell chambers flows through the respective duct openings into said common exhaust duct and thereupon to the atmosphere.

4,374,188

ELECTRIC STORAGE BATTERY

Stephen W. Campbell, Camberley; Eric E. Cragg; Michael J. Elwell, both of West Midlands, and Raymond A. Johnson, Birmingham, all of England, assignors to Lucas Industries Limited, Birmingham, England

PCT No. PCT/GB80/00163, § 371 Date Jun. 10, 1981, § 102(e) Date Jun. 10, 1981, PCT Pub. No. WO81/01074, PCT Pub. Date Apr. 16, 1981
PCT Filed Oct. 13, 1980, Ser. No. 276,383
Claims priority, application United Kingdom, Oct. 13, 1979, 7935626
Int. Cl.³ H01M 2/10
U.S. Cl. 429—187 11 Claims



1. A container element for an electric storage battery including a pair of carrying handles extending between respective pairs of spaced holes formed in projecting lugs on the container element, each handle including at least one strip of rope or similar flexible material passing through the associated pair of holes and joined at the ends to define a continuous loop, the portions of each loop extending between the associated pair of holes being held in juxtaposition so as to ensure that each handle is gripped by way of a double thickness of said rope or similar material.

4,374,189

PROCESS OF MAKING A HOLOGRAPHIC OPTICAL ARTICLE

Carl A. Heller, China Lake, and Warren J. Murbach, Sun City, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 104,511, Dec. 17, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,187
Int. Cl.³ G03C 5/04
U.S. Cl. 430—2 8 Claims

1. A method of making holographic optical devices by changing the index of refraction in selected portions of polymer material comprising the steps of:

cleaning noncross linked polymer film with acetone;

placing said cleaned polymer film between an upper and a lower quartz sheet;

putting a metal grating between said polymer material and said upper quartz sheet; and

exposing said polymer material in air by shining light of a predetermined wavelength through said metal grating and upper quartz sheet such that the duration of exposure determines the amount of change in the index of refraction that occurs in the exposed areas.

4,374,190

ERASABLE INTERMEDIATE DIAZO-TYPE PAPER

John Y. Hur, Poughkeepsie, N.Y., assignor to AM International, Inc., Chicago, Ill.

Continuation of Ser. No. 946,896, Sep. 28, 1978, abandoned. This application May 21, 1981, Ser. No. 265,742
Int. Cl.³ G03C 1/80
U.S. Cl. 430—19 2 Claims

1. An erasable, light transmitting, non-curling diazo-type intermediate comprising a transparentized paper substrate, a first dry barrier coating on said substrate, said coating being formed from a coating solution consisting of a non-aqueous solution of polyurethane and vinyl toluene-α-methyl styrene copolymer dissolved in a mixture of methyl ethyl ketone and methyl cellosolve acetate, and a second dry light sensitive layer overlying said first barrier layer, said second light sensitive layer being deposited from a non-aqueous aliphatic alcohol soluble sensitizer formulation comprising a diazo composition, said barrier layer being insoluble in said sensitizer formulation, said barrier layer having good adhesion to both said light sensitive layer and said paper.

4,374,191

DRY REVERSAL DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY AND ELECTROSTATIC PHOTOGRAPHIC METHOD USING THE SAME

Akio Mukoh; Hirosada Morishita; Masayasu Anzai, all of Hitachi; Kazuyoshi Tokunaga, and Yasuo Kikuchi, both of Katsuta, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 857,888, Dec. 6, 1977, abandoned. This application May 27, 1980, Ser. No. 153,319
Claims priority, application Japan, Dec. 10, 1976, 51-147748
Int. Cl.³ G03G 9/14, 13/09
U.S. Cl. 430—100 13 Claims

1. A method for recording electrostatic photography comprising the steps of charging a photoconductive drum, exposing said drum to light to form an electrostatic latent image corresponding to an image to be recorded, on said drum; reversal-developing said electrostatic latent image using dry reversal developer, said developer being deposited on said drum from a magnetic brush comprising a sleeve surrounding a magnetic roll; transferring toner deposited on said drum during said reversal-developing step to a record medium and fixing the transferred toner, characterized in that said reversal development is carried out with said sleeve and said photoconductive drum being grounded, whereby said sleeve and said photoconductive drum are non-biased relative to each other, and further characterized in that said dry reversal developer includes 100 parts by weight of individual carrier particles having ferromagnetic properties and 1–10 parts by weight of individual toner particles as essential ingredients and has a volume specific resistance that is sufficiently high such that the proximate counterelectrode effect of the magnetic brush created on the sleeve of the magnetic roll is reduced and a self-biasing voltage is produced substantially only by crests of the magnetic brush comprised of developer, wherein said volume specific resistance of the dry reversal developer is from 3.5×10^9 to 1×10^{11} Ω-cm, and wherein the magnetic brush has a resistance of above 4.5×10^7 Ω.

4,374,192
CARRIER COATING COMPOSITIONS OF BUTADIENE-ACRYLONITRILE RUBBER AND POLYURETHANE

Edward F. Mayer, San Jose; Arthur S. Diamond, Ventura, both of Calif., and Paul Chang, Hanover Park, Ill., assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 203,881, Nov. 4, 1980, Pat. No. 4,331,756. This application Feb. 25, 1982, Ser. No. 352,352
Int. Cl.³ G03G 9/10; B32B 25/02, 27/40
U.S. Cl. 430—108 12 Claims

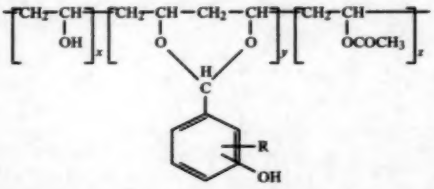
1. An electrophotographic developer composition comprising coated carrier particles together with toner particles, the coating comprising a miscible mixture of a butadiene-acrylonitrile rubber containing from about 20% to 40% by weight acrylonitrile together with a polyurethane elastomer, said mixture being soluble in organic solvents.

4,374,193
PHOTOSENSITIVE MATERIAL AND PROCESS FOR DEVELOPING THE SAME

Takeo Moriya, Kawagoe, and Toshio Yamagata, Urawa, both of Japan, assignors to Kimoto & Co., Ltd., Japan

Filed Apr. 29, 1981, Ser. No. 258,771
Claims priority, application Japan, May 16, 1980, 55-65044
Int. Cl.³ G03C 1/60, 5/34, 5/18; G03F 7/08
U.S. Cl. 430—149 7 Claims

1. A positive-working photosensitive material comprising: (1) a base material and (2) a layer of photosensitive composition formed on said base material and comprising (A), 100 weight parts of a resin binder containing at least 50 weight % of a vinylic polymer compound having an average polymerization degree of 300–2600 and represented by the general formula:

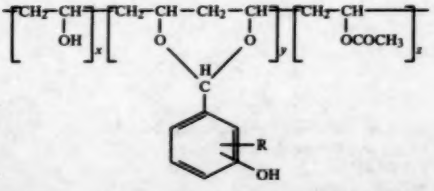


wherein R represents hydrogen, hydroxyl, carboxyl, alkyl, alkoxyl, aryl, nitro, amino or halogen; and having a copolymerization ratio of x:y:z of 5–50:5–85:10–60 and (B), 3–30 weight parts of an aromatic diazonium salt having only a single diazo group.

4. A process for developing a positive-working photosensitive material comprising:

providing a base material;

forming on said base material a layer of a photosensitive composition comprising (A), 100 weight parts of a resin binder containing at least 50 weight % of a vinylic polymer compound having an average polymerization degree of 300–2600 and represented by the general formula:



wherein R represents hydrogen, hydroxyl, carboxyl, alkyl, alkoxyl, aryl, nitro, amino or halogen; and having a copolymerization ratio of x:y:z of 5–50:5–85:10–60 and (B), 3–30 weight parts of an aromatic diazonium salt having only a single diazo group;

bringing said positive-working photosensitive material into intimate contact with a positive manuscript;

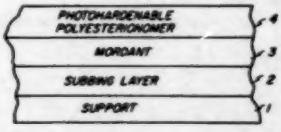
exposing said positive-working photosensitive material to radiation through said manuscript; and

developing said exposed material by contact with an alkali developer to obtain a positive relief image.

4,374,194
DYE IMBIBITION PHOTOHARDENABLE IMAGING MATERIAL AND PROCESS FOR FORMING POSITIVE DYE IMAGES

Hugh G. McGuckin; Susan E. Hartman, and Donald P. Specht, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 214,144, Dec. 8, 1980, abandoned. This application Dec. 4, 1981, Ser. No. 327,527
Int. Cl.³ G03C 5/54, 1/40, 5/00; B41M 5/00
U.S. Cl. 430—199 26 Claims



1. In a dye imbibition imaging element comprising, in sequence:

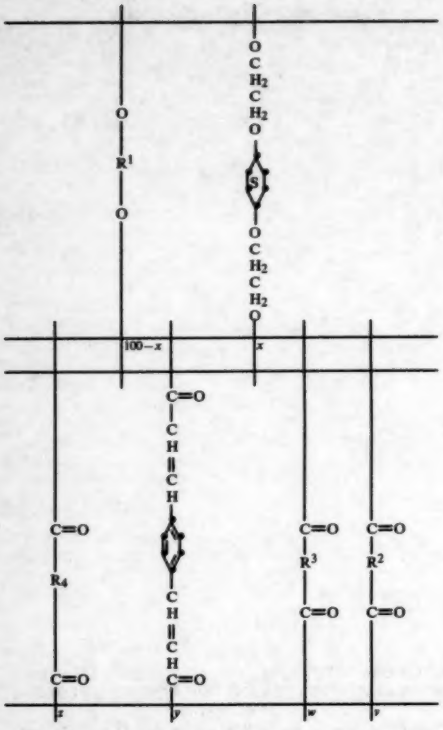
(a) a support having thereon,

(b) a cationic mordant layer for an anionic dye, and

(c) a sensitized photohardenable photopolymer layer superposed on said mordant layer,

the improvement wherein:

said photopolymer layer consists essentially of a photosensitive polyesterionomer represented by the formula:



wherein:

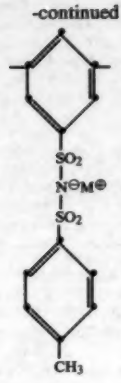
R^1 is straight or branched chain alkylene containing 2 to 10 carbon atoms, cycloalkylene containing 5 or 6 carbon atoms, or an aliphatic ether group containing 3 to 12 carbon atoms;

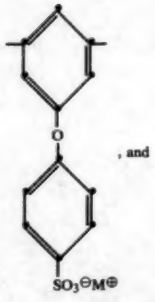
R^2 is an aromatic group containing 6 to 12 carbon atoms;

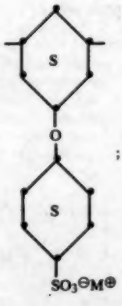
R^3 is straight or branched chain alkylene containing 2 to 10 carbon atoms;

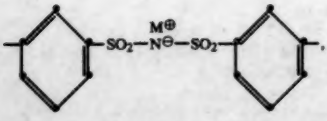
R^4 is an ionic group selected from those having the structures:

-continued









$M^{\oplus}$ is an alkali metal or ammonium ion;

x is 50 to 100 mole percent;

v is 0 to 35 mole percent;

w is 0 to 35 mole percent;

y is 50 to 85 mole percent; and

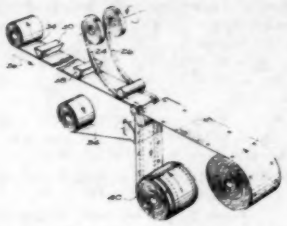
z is 15 to 40 mole percent.

4,374,195

INSTANT FILMSTRIP WITH AN ELASTIC COVER

William J. Hutchinson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1980, Ser. No. 215,889
Int. Cl.³ G03D 9/02; G03C 1/42
U.S. Cl. 430—499 4 Claims



1. A photographic film assembly comprising:

a filmstrip including first and second elongated superposed sheets each coated with photographic material, said filmstrip having leading and trailing ends and lateral edges and being helically wound trailing end first in a roll with said second sheet radially outwardly of said first sheet in each convolution of said roll; and

means joining said second sheet to said first sheet along said lateral edges to inhibit fluid processing composition introduced between said first and second sheets from leaking at said lateral edges, said second sheet being sufficiently elastic to accommodate the path length difference between the first and second sheets.

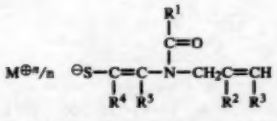
4,374,196

SILVER HALIDE EMULSIONS CONTAINING LATENT IMAGE STABILIZING COMPOUNDS

Arthur H. Herz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,360
Int. Cl.³ G03C 1/06
U.S. Cl. 430—505 18 Claims

1. A photographic silver halide emulsion containing as a latent image stabilizer, in a latent image stabilizing amount, a compound represented by the formula:



wherein:

R^1 is hydrogen, alkyl, or aryl;

R^2 and R^3 are each individually hydrogen, alkyl, alkoxy, carboxy, alkoxycarbonyl, or aminocarbonyl;

R^4 and R^5 are each individually hydrogen, alkyl, aryl, cyano, halogen, formyl, carboxy, alkylcarbonyl, arylcarbonyl, alkoxycarbonyl, aryloxycarbonyl or aminocarbonyl;

n is an integer of 1 or 2; and

$M^{\oplus n}$ is a cation of valence n.

4,374,197

PROCESS FOR THYMOSIN α_1

Bernard L. Horecker, New York, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 201,687, Oct. 30, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,324
Int. Cl.³ C12P 21/00; C12N 9/10
U.S. Cl. 435—68 10 Claims

1. A process for preparing thymosin α_1 comprising reacting N^{α}-desacetylthymosin α_1 with an acetylating agent in the presence of transacetylase in an aqueous solvent, so as to selectively acetylate the N^{α}-amino group of N^{α}-desacetylthymosin α_1.

4,374,198

RAPID UTILIZATION OF DISACCEARIDES BY FERMENTATION

Franklyn D. Miller, Cincinnati, Ohio, and Werner C. Muller, Dobbs Ferry, N.Y., assignors to National Distillers & Chemical Corp., New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,314
The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.
Int. Cl.³ C12P 7/14
U.S. Cl. 435- -162 11 Claims

1. A process for the production of ethanol by continuous fermentation which comprises carrying out fermentation upon an aqueous solution of fermentable sugar and a minor amount of sugar oligomer and/or sugar repolymerizate in a series of fermentation vessels employing at least two different strains of ethanol-producing yeast, the first strain of yeast providing a relatively high rate of conversion of fermentable sugar to ethanol in a fermentation medium containing a concentration of fermentable sugar which does not significantly retard the rate of growth of the yeast, and the second strain providing a relatively high rate of conversion of sugar oligomers and/or sugar repolymerizates to ethanol, each of said strains of yeast being separately employed in its own fermentation vessel from which said yeast is separately recovered therefrom and recycled thereto.

4,374,199

METHOD FOR GENERATION OF BIO-GAS

Vernon H. Carter, P.O. Box 95 PSR, Elkins, Ark. 72727

Filed Nov. 3, 1980, Ser. No. 203,247
Int. Cl.³ C05F 11/08; C12N 13/00; C12P 5/02
U.S. Cl. 435—167 6 Claims

1. In a process for producing bio-gas by continuously introducing organic wastes into a digester, collecting bio-gas from the digester as it is produced by the fermentation of the organic wastes and continuously withdrawing sludge from the digester, the improvement comprising:

(a) introducing magnetotactic bacteria into the digester in an amount sufficient to facilitate the fermentation of said organic wastes; and

(b) prohibiting said bacteria from exiting said digester with the sludge withdrawn therefrom by creating a magnetic field in said digester to situate said bacteria apart from said sludge, whereby said bacteria is retained in said digester as said sludge is being withdrawn.

4,374,200

BROAD HOST RANGE SMALL PLASMID RINGS AS CLONING VEHICLES

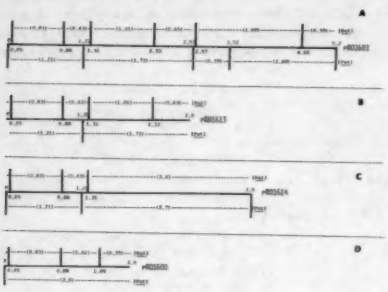
Ronald H. Olsen, Ann Arbor, Mich., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed May 8, 1980, Ser. No. 147,563
Int. Cl.³ C12N 15/00; C12P 21/00, 21/02, 19/34; C12N 1/20, 1/00; C12R 1/065, 1/22, 1/38, 1/19
U.S. Cl. 435—172 17 Claims

1. The process for producing recombinant deoxyribonucleic acid plasmids which comprises:

(a) providing a first plasmid as a cloning vehicle selected from pRO1600, pRO1601, pRO1613, pRO1614, pRO1615, and pRO1616 as carried in *Pseudomonas aeruginosa* NRRL-B-12124 NRRL-B-12125, NRRL-B-12126, NRRL-B-12127, NRRL-B-12149 and NRRL-B-12148, respectively;

(b) reacting the first plasmid and a second deoxyribonucleic acid source with at least one restriction endonuclease



which cleaves the first plasmid and the second deoxyribonucleic acid source into linear DNA fragments; and

(c) randomly recombining the linear deoxyribonucleic acid fragments using ligation to form recombinant plasmids which replicate during cell division when provided in a bacterial cell, wherein deoxyribonucleic acid from the cloning vehicle controls replication of the recombinant plasmid during cell division.

4,374,201

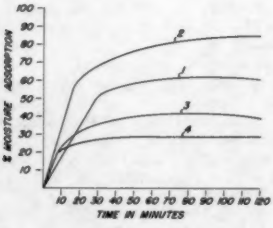
PROCESS FOR COATING A DRY VARIOLA VIRUS

Michael D. Orlando, and Jean M. Riley, both of Frederick, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 9, 1965, Ser. No. 471,792

Int. Cl.³ C12N *5/00*

U.S. Cl. 435—239 **2 Claims**



1. A process for coating dry variola virus which comprises the steps of:

(a) chorioallantoic inoculation of the embryo of fertile eggs,

(b) incubating the eggs for a period of time sufficient to cultivate the virus,

(c) separating the embryo from the rest of the egg,

(d) homogenizing the harvested embryo,

(e) stabilizing the resultant mixture by the addition thereto of a stabilizer comprising the following percent weight per volume: 0.5% to 2.0% lactose; 0.5% to 2.0% raffinose; 0.3% to 1.2% lysine; 0.3% to 1.2% sodium glutamate; 0.1% to 0.4% isoniazid; and 0.1% to 0.4% thiourea.

(f) pelletizing, freeze-drying, pooling and milling of the stabilized slurry,

(g) treatment of the milled dried variola material with methyl amyl acetate in a ratio of 1:10 by weight and the agitation thereof,

(h) filtering the resultant mixture under a vacuum,

(i) recovering the product.

4,374,202

CERAMIC FIBER FOAM AND METHOD FOR MAKING SAME

Jerry Zucker, Charleston, S.C., and Beth W. Porlier, Missouri City, Tex., assignors to RM Industrial Products Company, Inc., North Charleston, S.C.

Filed Dec. 23, 1980, Ser. No. 220,246

Int. Cl.³ C04B *21/06, 21/10, 35/22, 3/06*

U.S. Cl. 501—82 **10 Claims**

1. A light weight heat resistant body, said body comprising from about 50 to about 95 percent ceramic fiber, exclusive of glass and asbestos fiber, in the form of a porous elastic foam, said fiber being selected from the group containing at least one of aluminum oxide and calcium oxide, said body having a bulk density of from about 0.3 to about 6 pounds per cubic foot and being resistant to temperatures in excess of 1900° F.

4,374,203

STABLE CLAY SLURRIES

Thomas D. Thompson, Flemington; John F. Gergel, Perth Amboy, and Peter Economou, Millington, all of N.J., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Filed Mar. 10, 1982, Ser. No. 356,935

Int. Cl.³ C09C *1/42*

U.S. Cl. 501—148 **6 Claims**

1. A stable calcined clay suspension comprising at least 50% by weight of calcined clay in an aqueous medium in the presence of about 0.30% to 0.49% by weight of anionic polymer and about 0.007% to 0.011% by weight of cationic polymer in the slurry.

4,374,204

POROUS OPEN-CELL FILLED REACTIVE MATERIAL CONTAINING A POLYMERIC MATRIX AND REACTIVE FILLER

Sasho P. Alexandrov, ulitsa Sadovaya, 54, kv. 511; Gadyisha M. Mubarakshin, ulitsa Leni Golikova, 23, korpus 4, kv. 16; Leonard A. Volf, ulitsa Novosibirskaya 18/5, kv. 45, and Stanislav V. Burinsky, ulitsa Bukharestskaya, 45, kv. 55, all of Leningrad, U.S.S.R., assignors to Leningradsky Ordena Trudovogo Krasnogo Znameni Institut Textilnoi I Legkoi Promyshlennosti Imeni S.M. Kirova, U.S.S.R.

Filed May 19, 1980, Ser. No. 151,529

Int. Cl.³ B01J *39/00, 41/00, 43/00*

U.S. Cl. 521—28 **6 Claims**

1. A porous open-cell filled reactive material consisting of a polymeric matrix selected from the group consisting of foamed polyvinylformal and foamed polyurethane, and a reactive filler selected from the group consisting of finely divided ion-exchange fibres, complex-forming fibres and mixture thereof, the length of the fibers being substantially greater than the size of the pores and has been added after the content of fibres being from 10 to 80% by mass of the final material.

4,374,205

STABILIZATION OF POST-CHLORINATED VINYL CHLORIDE POLYMERS BY PHOSPHATE SALTS

Dale R. Hall, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 159,532, Jun. 16, 1980, Pat. No. 4,345,040. This application Jun. 23, 1982, Ser. No. 391,317

Int. Cl.³ C08J *9/40*

U.S. Cl. 521—85 **6 Claims**

1. A composition comprising a particulate porous chlorinated vinyl chloride polymer having a density in the range of from about 1.46 to about 1.65 grams/cc at 25° C., from about

5% to about 65% by volume of porespace, and a chlorine content in the range of from about 60% to about 72% by weight, a primary stabilizer other than a metal salt of phosphoric acid for said chlorinated vinyl chloride polymer uniformly dispersed throughout said composition of matter, and a metal salt of phosphoric acid uniformly dispersed throughout said composition of matter.

4,374,206

SYNTHESIS OF BASE-STABLE ALIPHATIC ANION EXCHANGE POLYMERS

Russel J. MacDonald, Wilmington, and Russell B. Hodgdon, Sudbury, both of Mass., assignors to Ionics Incorporated, Watertown, Mass.

Filed Feb. 23, 1981, Ser. No. 237,018
Int. Cl.³ C08F *20/36*; B01J *39/20, 14/44*
U.S. Cl. 521—38 11 Claims

1. A process for preparing a cross-linked quaternary amine anion exchange polymer comprising (a) reacting an alcoholic solution of glycidyl methacrylate with a solid tertiary amine-acid salt to yield a non-homogeneous alcohol mixture of an quaternary amine monomer (b) adding sufficient water to said non-homogeneous mixture until said mixture becomes homogeneous (c) adding a cross-linking polyol methacrylate ester monomer to the mixture to form a homogeneous liquid mixture of said ionic and cross-linking monomers and thereafter polymerizing said monomeric mixture by heating in the presence of a polymerization catalyst.

4,374,207

INTUMESCENT FLEXIBLE POLYURETHANE FOAM

Herman Stone, Hazleton; Peter D. Pauly, Mountaintop, and Pcolinsky, Jr., Hazleton, all of Pa., assignors to G.F.C. Foam Corporation, Paramus, N.J.

Filed Oct. 24, 1980, Ser. No. 200,128
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—107 36 Claims

1. In the process for the manufacture of a flexible, resilient, flame retardant and intumescent polyurethane foam from a reaction mixture consisting essentially of at least one polyether polyol, at least one organic polyisocyanate, at least one flame retardant, at least one blowing agent, at least one surfactant, and at least one catalyst, the improvement wherein the amount of said flame retardant is from about 30 to about 160 phr, and said reaction mixture also contains from about 200 to about 400 phr of hydrated alumina uniformly dispersed in from about 10 to about 100 phr of a low-viscosity, linear, polyester diol.

4,374,208

POLYETHER-URETHANE FOAMS

John C. J. Fallows, and Richard G. Harvey, both of High Wycombe, England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 233,116, Feb. 10, 1981, abandoned. This application Nov. 24, 1981, Ser. No. 324,418
Claims priority, application United Kingdom, Feb. 20, 1980, 8005791
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—109 13 Claims

1. A one-shot process for the production of a polyetherurethane foam by reacting in a foam-forming reaction mixture:

(a) a polyoxyalkylene polyol containing at least two hydroxy groups per molecule, from 0 to 20% by weight polyoxyethylene groups and less than 20 mole percent primary hydroxyl groups and having a molecular weight in the range 1500 to 10000;

(b) a tolylene diisocyanate;

(c) a polyoxyalkylene/polysiloxane block copolymer of the type used in conventional (as opposed to high-resilience) urethane foam formulations:

(d) a blowing agent and

(e) at least one catalyst, wherein the reaction mixture additionally contains at least one substance selected from the group consisting of degradation products of a starch and starch derivatives having a degree of substitution less than 0.25, said degradation products and said derivatives containing up to 15% by weight of water.

4,374,209

POLYMER-MODIFIED POLYOLS USEFUL IN POLYURETHANE MANUFACTURE

Jeffrey P. Rowlands, Jona S. Gallen, Switzerland, assignor to Interchem International S.A., Luxembourg

Continuation-in-part of Ser. No. 208,633, Nov. 20, 1980, abandoned. This application Apr. 29, 1981, Ser. No. 258,620
Claims priority, application United Kingdom, Oct. 1, 1980, 8031649; Feb. 2, 1981, 8103105
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—116 29 Claims

1. A method of forming a polymer-modified polyol, comprising polymerising a starting material with an organic polyisocyanate in the presence of a polyol with the polyol acting at least predominantly as an unreacted carrier, the starting material being triethanolamine and the triethanolamine reacting at least predominently polyfunctionally with the isocyanate.

4,374,210

POLYUREA-POLYURETHANE FROM A MIXTURE OF A POLYOL, AN AROMATIC DIAMINE, AND AN ISOCYANATE-TERMINATED PREPOLYMER

James H. Ewen; Thomas R. McClellan, both of Seabrook; Michael H. McMillin, Pasadena, and Pat L. Murray, Baytown, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 18, 1981, Ser. No. 303,217
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—159 20 Claims

1. In a process for the production of a polyurea-polyurethane by the reaction of an organic polyisocyanate with a polyol and an aromatic diamine wherein at least one of the positions ortho to each of the amino groups is substituted by lower-alkyl, in the presence of a catalyst for the reaction between hydroxy groups and isocyanato groups, the improvement which comprises employing as the organic polyisocyanate an isocyanate-terminated prepolymer having an isocyanate content of about 9 to about 20 percent derived by reaction of 4,4′-methylenebis(phenyl isocyanate) with a polyol having a functionality from 2 to 3 selected from the class consisting of copolymers of ethylene oxide and propylene oxide having molecular weights from about 1000 to about 10,000, polytetramethylene glycols having molecular weights from about 600 to about 5,000 and polyester polyols having molecular weights from about 500 to 8,000, said polyol and said isocyanate being reacted in the proportion of about 0.01 equivalents to about 0.5 equivalents of said polyol per equivalent of said isocyanate.

4,374,211

ARAMID CONTAINING FRICTION MATERIALS

John P. Gallagher, Bayville, N.J., and Philip H. Dougherty, Penndel, Pa., assignors to Thiokol Corporation, Newtown, Pa.

Filed Sep. 15, 1981, Ser. No. 302,330
Int. Cl.³ C08L *61/06*
U.S. Cl. 523—156 40 Claims

1. A non-asbestos type friction material composition suitable for use as a friction element consisting essentially of a thermosetting binder, a fibrous reinforcing material, and an effective amount of an aramid polymer pulp fiber to result in good structural integrity of a preform manufactured from said friction material.

4,374,212

SHEET HANDLING DEVICE

Arthur C. Martellock, Pittsford; Richard L. Carlston, and Shwu-Jian Liang, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1981, Ser. No. 288,097
Int. Cl.³ C08L 61/06
U.S. Cl. 523—212 7 Claims

1. A sheet handling device for use in an electrostatographic copying machine wherein a sheet is conveyed by frictional engagement with a handling member, said handling device comprising a handling member which comprises a silicone roller composition obtained from the functional surface of room temperature vulcanization of a room temperature vulcanizable silicone rubber composition comprising a diorganopolysiloxane, a treated filler, an organosilicate, and a curing catalyst, said treated filler being a silica filler treated with a mixture of a hydroxyl amine, a cyclic siloxane, and a silyl nitrogen compound.

4,374,213

ALKALINE RESISTANT ORGANIC COATINGS FOR CORROSION SUSCEPTIBLE SUBSTRATES III

Ray A. Dickie, Birmingham; Joseph W. Holubka, Livonia, and S. Burhan A. Qaderi, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 938,670, Aug. 31, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 139,068
Int. Cl.³ C08L 63/00
U.S. Cl. 523—416 5 Claims

1. A water dilutable primer concentrate that provides upon intimate admixture with water a primer composition which retards corrosion even in substantial absence of chromate corrosion inhibiting pigments and which comprises an intimate admixture of film forming ingredients which consist essentially of:

(A) A substantially gel free epoxy and amine reaction product which contains no ester linkages and which is made by reacting in non-aqueous water miscible medium reactants consisting essentially of:

1. An epoxy reactant having two 1,2-epoxy groups per molecule which is the reaction product of bisphenol A and epichlorohydrin and has an epoxide equivalent weight range from at least about 875 to 4,000; and
2. A water soluble amine reactant selected from the group consisting of secondary monoamines having a total of up to about 20 carbons, and comprising at least about 90 mole percent secondary hydroxy amine that has two or more alkyl groups each bearing a primary hydroxy group

in a stoichiometric amount such that the reaction product (A) comprises tertiary amino and primary and secondary hydroxy groups and is substantially free of unreacted epoxy groups;

(B) An amino aldehyde resin crosslinking agent at about 5–30% by weight of A; and

(C) Non-chromate pigment at a weight ratio of A+B+C of about 40:60 to 60:40, wherein a mixture of A, B, and C is neutralized at least partially with D a weak organic acid.

4,374,214

IMIDE CONTAINING BLENDS AND POLYMERIC COMPOSITIONS PREPARED THEREFROM

Fred F. Holub, Schenectady, N.Y., and John T. Hobeck, Wilmington, Del., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 167,125, Jul. 9, 1980, abandoned, which is a continuation of Ser. No. 785,501, Apr. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 487,715, Jul. 11, 1974, abandoned, which is a continuation of Ser. No. 375,715, Jul. 2, 1973, abandoned, which is a division of Ser. No. 200,590, Nov. 19, 1971, Pat. No. 3,763,087. This application Mar. 3, 1981, Ser. No. 239,963
Int. Cl.³ C08L 63/02
U.S. Cl. 523—466 5 Claims

1. Curable compositions comprising by weight,

(A) an epoxy resin prepared from epichlorohydrin and bisphenol-A,

(B) from about 0.2 to about 0.5 parts of a bismaleimide per part of (A),

(C) from about 0.2 to about 0.5 part per part of (A) of an arylene diamine selected from the class consisting of metaphenylene diamine and para,para-methylene dianiline and

(D) and 0.01–5% by weight of the curable composition of an organic peroxide.

4,374,215

POLYESTER MOLDINGS

Kenneth E. Atkins, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 93,589, Nov. 13, 1979, abandoned. This application Oct. 16, 1980, Ser. No. 194,069
Int. Cl.³ C08L 67/00
U.S. Cl. 523—514 18 Claims

1. In a composition containing an unsaturated polyester, a polymerizable ethylenically unsaturated monomer which serves to crosslink the unsaturated polyester to a thermoset product and a thermoplastic polymer low profile additive, the improvement which comprises incorporating into said composition an effective amount of a secondary crosslinkable vinyl monomer having a reactivity ratio r_1 with styrene of greater than 1 whereby sheet molding and bulk molding compositions are produced which provide molded articles with superior surface appearance.

4,374,216

STABLE HIGH SOLIDS WATER-IN-OIL SLURRY DISPERSION COMPOSITION

Laurence G. Dammann, Crestwood, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,977
Int. Cl.³ C08L 1/08, 5/00; C08J 3/06
U.S. Cl. 524—35 17 Claims

1. A process for the production of a non-gelling water-in-oil high solids slurry dispersion of water-soluble polymer which comprises (1) subjecting a water-in-oil dispersion of synthetic water-soluble polymer to distillation to reduce the water content to less than about 15 weight percent of the dispersion; and (2) slurrying a quantity of finely divided solid water-soluble polymer into the step (1) water-reduced dispersion to provide a slurry dispersion containing between about 40–80 weight percent of water-soluble polymer, based on the weight of the slurry dispersion composition.

4,374,217
COLD-SETTING STARCH ADHESIVE

Kanichi Miyake, Fujisawa; Masahiro Tokuda, Yokohama; Takaaki Aoki, Yokohama; Hideaki Miyakawa, Yokohama, and Yasuo Tamura, Yokohama, all of Japan, assignors to Hohnen Oil Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,550

Claims priority, application Japan, Jan. 14, 1981, 56-4200; Apr. 7, 1981, 56-51941

Int. Cl.³ C08L *3/00, 3/04*

U.S. Cl. 524—47 **14 Claims**

1. A cold-setting starch adhesive comprising hot high solid aqueous paste of gelatinized starch containing as adhesive component a mixture of 20 to 80% by weight of unmodified or modified high amylose corn starch having an amylose content of at least 50%, 10 to 70% by weight of unmodified or modified ordinary corn starch, and 1 to 10% by weight of waxy corn starch.

2. A water-resistant, cold-setting starch adhesive comprising hot high solid aqueous paste of gelatinized starch containing as adhesive component a mixture of 20 to 80% by weight of unmodified or midified high amylose corn starch having an amylose content of at least 50%, 10 to 79% by weight of unmodified or modified ordinary corn starch, and 1 to 10% by weight of waxy corn starch, and formaldehyde resin solution.

4,374,218
RESILIENT SEALING COMPOSITIONS

Kay-Kiong Tay, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 25, 1982, Ser. No. 352,510

Int. Cl.³ C08K *3/22, 5/04, 5/09, 5/17*

U.S. Cl. 524—86 **2 Claims**

1. A composition of matter comprising

(a) from 69 to 81 parts by weight of at least one elastomeric homopolymer of 1,3-butadiene;

(b) 100−x, wherein x is the amount, in parts by weight, of said elastomeric homopolymer of 1,3-butadiene, of at least one copolymer of styrene and 1,3-butadiene;

(c) from 2 to 10 parts by weight of zinc oxide;

(d) from 100 to 120 parts by weight of carbon black, such carbon black consisting of 25–32 percent by weight of at least one high abrasion furnace black, 27–35 percent by weight of at least one semi-reinforcing furnace/high modulus black, and 37–46 percent by weight of at least one medium thermal black;

(e) from 2 to 30 parts by weight of at least one polymerizable methacrylic monomer having at least two polymerizable methacrylate groups;

(f) from 0.1 to 10 parts by weight of at least one organic peroxide;

(g) from 0.1 to 5 parts by weight of stearic acid; and

(h) from 0.1 to 10 parts by weight of at least one compound selected from the group consisting of antioxidants and antiozanants.

4,374,219
ALKANOLAMINE ESTER OF 1,1-BIPHENYL-2,2-DIYL-AND ALKYLIDENE-1,1-BIPHENYL-2,2-DIYL-CYCLIC PHOSPHITES

John D. Spivack, Spring Valley; Martin Dexter, Briarcliff Manor, and Stephen D. Pastor, Spring Valley, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

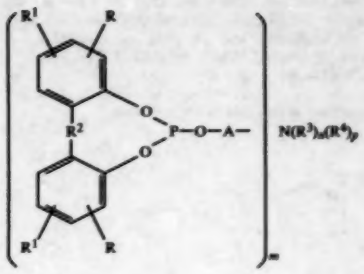
Continuation-in-part of Ser. No. 209,786, Nov. 24, 1980, Pat. No. 4,318,845. This application Jul. 23, 1981, Ser. No. 285,901

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ C08K *5/52*

U.S. Cl. 524—91 **8 Claims**

1. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound corresponding to the formula



wherein m, n and p are each 1, m is 2 and n is 1 and p is 0 or m is 3 and n and p are 0, and wherein

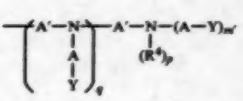
R is alkyl of from 1 to 18 carbon atoms,

R^1 is hydrogen or alkyl of from 1 to 18 carbon atoms,

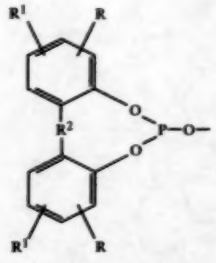
R^2 is a direct bond or alkylene of from 1 to 12 carbon atoms,

A is alkylene of from 1 to 6 carbon atoms, or cycloalkylene of 5 to 6 carbon atoms,

R^3 is alkyl of 1 to 18 carbon atoms, or



wherein Y is



A′ is alkylene of 1 to 6 carbon atoms or cycloalkylene of 5 to 6 carbon atoms,

m′ is 1 or 2,

p is 0 or 1, and

q is 0–5,

with A, R, R^1, R^2 being as previously defined; provided that when p and q are 0, -N-A′-N can be a diazacycloalkyl group of 2 to 10 carbon atoms, or

when m is 1 and p is 0, N-R_3 is a azacycloalkyl group of 2 to 10 carbon atoms or an azaoxacycloalkyl group of 3 to 7 carbon atoms; and

R^4 is alkyl of 1 to 18 carbon atoms;

together with a phenolic antioxidant selected from the group consisting of 6,6′-ethylidene-bis(2,4-di-tert.butylphenol), 6,6′-methylene-bis(2,4-di-tert.butylphenol) and 1,3,5-tris(4-tert.butyl-3-hydroxy-2,6-dimethylbenzyl)isocyanurate.

4,374,220

IMIDE FLAME RETARDANTS AND COMPOSITIONS CONTAINING THEM

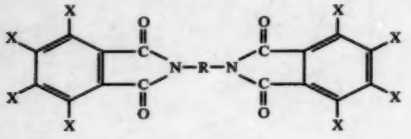
Joseph Sonnenberg, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 77,494, Sep. 21, 1979, which is a division of Ser. No. 760,664, Sep. 18, 1968, Pat. No. 4,166,605. This application May 14, 1981, Ser. No. 263,679

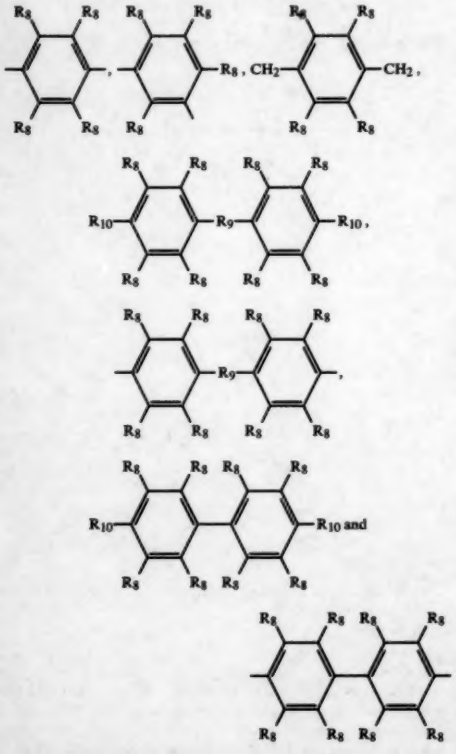
Int. Cl.³ C08K *5/34*; C07D *207/44*

U.S. Cl. 524—94 **46 Claims**

21. A composition comprising an inflammable macromolecular material; a bisimide of the formula



wherein R represents a divalent organic radical selected from the group consisting of alkylene radicals containing 2 to 18 carbon atoms, and divalent aryl, substituted aryl or aralkyl radicals selected from the group consisting of



in which each R_8, which may be the same or different, represents a radical selected from the group consisting of hydrogen, an alkyl radical containing from 1 to 4 carbon atoms, bromine and chlorine, R_9 represents a radical selected from the group consisting of alkylene radicals, containing from 1 to 4 carbon atoms and hetero atoms and R_{10} represents an alkylene radical containing from 1 to 4 carbon atoms; and wherein each X is independently bromine or hydrogen with the proviso that at least 4 of the X's are bromine; and a compound of the element of Group V.

4,374,221

HIGH SOLIDS POLYAMIDE-IMIDE MAGNET WIRE ENAMEL

Charles W. McGregor, and Stephen E. Summers, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Nov. 17, 1981, Ser. No. 322,114

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—94 **23 Claims**

1. A magnet wire enamel comprising a high solids, low viscosity, low molecular weight polymer solvent solution of the reaction product of a polyisocyanate, an isocyanate blocking alcohol and trimellitic anhydride, the ratio of free isocyanate groups to total anhydride and carboxyl groups in the reaction product being about 0.99:1 to 0.85:1.

4,374,222

COMPOSITIONS CONTAINING MOLD RELEASE AGENTS

Louis W. Meyer, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 239,279, Mar. 2, 1981, abandoned. This application Sep. 30, 1981, Ser. No. 306,997

Int. Cl.³ C08K *5/16*

U.S. Cl. 524—241 **28 Claims**

1. In a process for the preparation of molded articles by injecting a polyurethane-forming composition containing at least one active hydrogen-containing material and at least one material containing an average of more than one —NCO group per molecule into a mold and thereafter removing a resultant polyurethane molded article therefrom; the improvement which comprises employing as said polyurethane-forming composition one which contains an effective amount of, as a mold release agent, at least one fatty acid amide having at least one of the hydrogen atoms attached to the nitrogen of an amide group replaced with a hydroxyl-containing substitutent.

4,374,223

ELASTIC COVER OF AN ELASTOMERIC MATERIAL

Cornelis Van Raamsdonk, Schortens, and Johann Wartusch, Vellmar, both of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven and Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,699

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915643

Int. Cl.³ B41J *3/04*; C08K *5/05, 3/34*

U.S. Cl. 524—245 **13 Claims**

1. An elastic covering for closing off a nozzle outlet area containing at least one nozzle orifice of an ink printing head filled with an aqueous liquid, said covering consisting essentially of an elastomeric material having viscoelastic properties for filling exceedingly small cavities and interstices in the area to be closed off, wherein the elastomeric material comprises a mixture of a polar elastomer selected from the group consisting of butadiene-acrylonitrile copolymer and ethylene—vinyl acetate copolymers, a hydrophillic additive comprised of an adduct of ethylene oxide with amines, and at least one cross-linking ingredient.

4,374,224

TREE-RESISTANT ETHYLENE POLYMER COMPOSITIONS CONTAINING AROMATIC POLYCARBOXYLIC ACID

John K. Beasley, Wilmington, Del., and Edward J. Urban, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 14, 1981, Ser. No. 301,513
Int. Cl.³ C08K 5/12
U.S. Cl. 524—298 11 Claims

1. A tree-resistant composition for use in electrical equipment, said composition consisting essentially of an ethylene polymer selected from the group consisting of ethylene homopolymers and ethylene copolymers with at least one other ethylenically unsaturated monomer, ethylene being present in such copolymers in an amount of at least 85 weight percent, and, as a tree-growth inhibitor, an effective amount of at least one organic carboxylic ester having at least one aromatic ring and at least three carboxylic ester groups, said inhibitor melting below about 50° C. and being liquid at the power transmission cable's intended operating temperature.

4,374,225

METHOD OF FABRICATING AN ERASER

Takamasa Kawakubo, Shinmachi, and Kiyosi Hirasawa, Fujioka, both of Japan, assignors to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 196,088
Int. Cl.³ B43L 19/00
U.S. Cl. 524—302 5 Claims

1. A method of fabricating an eraser comprising the step of mixing and kneading 50 to 800 parts by weight by factice, 0 to 500 parts by weight of filler and predetermined amount of pigment with 40 to 100 parts by weight of low crystallizable polyolefin graft copolymer thermoplastic elastomer obtained by conducting ethylene and α-olefin of stock materials by means of coordinating anionic polymerization and one type of graft reaction.

4,374,226

POLYCARBONATE HAVING IMPROVED HYDROLYTIC STABILITY

Parameswar Sivaramakrishnan, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 866,881, Jan. 4, 1978, abandoned, which is a continuation of Ser. No. 777,205, Mar. 14, 1977, abandoned, which is a continuation of Ser. No. 659,316, Feb. 19, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,758
Int. Cl.³ C08K 5/09
U.S. Cl. 524—399 5 Claims

1. A halogen-free moldable aromatic polycarbonate comprising:

(a) an aromatic polycarbonate resin; and

(b) a cadmium salt of an organic acid selected from the group consisting of cadmium 2-ethylhexanoate and cadmium laurate,

characterized in that said salt is present in said polycarbonate resin in an amount between 0.01 to 0.1% by weight based on the weight of said polycarbonate resin.

4,374,227

EXTRUDED GLOSS IMPROVEMENT IN PIPE BLENDS WITH LOW PRESSURE LOW DENSITY POLYETHYLENE

William J. Michie, Jr., Raritan, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 15, 1981, Ser. No. 263,887
Int. Cl.³ C08K 3/04
U.S. Cl. 524—528 22 Claims

1. A thermoplastic pipe forming composition having

a nominal density of about 0.926 to 0.940 grams per cubic centimeter; and a melt index of about 0.1 to about 2.0 decigrams per minute,

and comprising, based on the total weight of said composition, about 40 to about 80 parts by weight of high density ethylene polymer having

a density of greater or equal to 0.941 to about 0.959 grams per cubic centimeter; and a melt index of about 0.1 to about 2.0 decigrams per minute, and

about 10 to about 50 parts by weight of a first low pressure, low density alkylene interpolymer having

a density of about 0.910 to 0.925 grams per cubic centimeter; and a melt index of about 0.1 to 2.0 decigrams per minute, and

about 5.5 to about 9.5 parts by weight of a concentrate comprising, based on the total weight of said concentrate, about 25 to about 45 parts by weight of carbon black, and from about 55 to about 75 parts by weight of a second low pressure, low density alkylene interpolymer having

a density of about 0.910 to 0.925 grams per cubic centimeter; and a melt index of about 0.1 to 2.0 decigrams per minute.

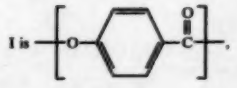
4,374,228

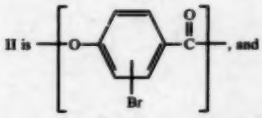
WHOLLY AROMATIC POLYESTER CAPABLE OF FORMING AN ANISOTROPIC MELT PHASE CONSISTING ESSENTIALLY OF PARA-OXYBENZOYL MOIETY, BROMO-SUBSTITUTED-PARA-OXYBENZOYL MOIETY, AND META-OXYBENZOYL MOIETY

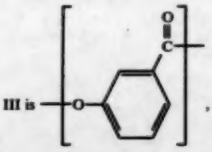
Jeffrey T. Langley, Pineville, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,587
Int. Cl.³ C08G 63/02
U.S. Cl. 524—599 20 Claims

1. A melt processable wholly aromatic polyester capable of forming an anisotropic melt phase at a temperature below approximately 300° C. consisting essentially of the recurring moieties I, II, and III wherein:

I is  ,

II is  , and

III is  ,

wherein said polyester comprises approximately 35 to 70 mole percent of moiety I, approximately 15 to 45 mole percent of moiety II, and approximately 15 to 45 mole percent of moiety III.

4,374,229
THERMOSETTING RESINOUS MOLDING COMPOSITIONS

William R. Dunnavant; Richard E. Field, both of Columbus, and Dan Borgnaes, Westerville, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 130,954, Mar. 17, 1980, abandoned, which is a continuation of Ser. No. 16,718, Mar. 1, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,282

Int. Cl.³ C08L *75/06*

U.S. Cl. 525—28 **11 Claims**

1. A thermosetting resinous composition comprising an organic polyisocyanate coupled oligomeric polyester having a calculated molecular weight of from 200 to 800 terminated at one end with a hydroxy group and at the other end with a vinyl group and wherein the polyisocyanate and polyester are combined in the coupling reaction to provide an NCO/OH equivalent ratio value of from 0.8–1.2, said polyester prepared by the catalytically induced addition reaction of a dicarboxylic acid anhydride selected from the group consisting of maleic anhydride and a mixture of maleic anhydride and phthalic anhydride in which maleic anhydride constitutes the major proportion thereof with a lower alkylene oxide in the presence of methacrylic acid or acrylic acid as the initiator and wherein the maleate residues of said polyester are substantially completely isomerized to corresponding fumarate residues.

4,374,230
STABILIZED POLYOLEFIN COMPOSITIONS

John L. H. Allan, Glen Rock; Arnold B. Finestone, Woodcliff Lake, both of N.J., and John J. Roderick, Avon Lake, Ohio, assignors to El Paso Polyolefins Company, Paramus, N.J.

Division of Ser. No. 705,303, Jul. 14, 1976, abandoned. This application Mar. 28, 1979, Ser. No. 24,499

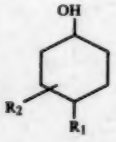
Int. Cl.³ C08L *23/00*

U.S. Cl. 525—134 **19 Claims**

1. A mono-α-olefin polymer composition stabilized against copper-activated accelerated oxidative degradation, which comprises:

a mono-α-olefin polymer and from about 0.1 to about 10 percent by weight based on the total weight of the composition of a polymeric compound as the sole copper deactivating agent, which polymeric compound has been prepared by a process comprising

(a) reacting at least one para-substituted phenol of the formula:



wherein

R_1 is a C_3–C_{30} group selected from alkyl, cycloalkyl, alkaryl or aryl and R_2 is either hydrogen, a sulfonic acid group or a sulfonic acid salt group;

with an aldehyde or ketone of the formula:

wherein

R_3 and R_4 independently from each other can be either hydrogen or a C_1–C_{36} group selected from alkyl, cycloalkyl, alkaryl or aryl,

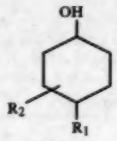
in a molar ratio of aldehyde or ketone to phenol of at least about 2:1 in the presence of an alkaline catalyst; and

(b) condensing the product of step (a) under neutral or slightly acidic conditions.

10. The method of imparting stability to a mono-α-olefin polymer composition against copper-activated accelerated oxidative degradation, comprising:

incorporating into a mono-α-olefin polymer resin from about 0.1 to about 10 percent by weight based on the weight of the composition of a polymeric compound as the sole copper deactivating agent, which polymeric compound has been prepared by a process comprising:

(a) reacting at least one para-substituted phenol of the formula:



wherein

R_1 is a C_3–C_{30} group selected from alkyl, cycloalkyl, alkaryl or aryl and R_2 is either hydrogen, a sulfonic acid group or a sulfonic acid salt group,

with an aldehyde or ketone of the formula:

wherein

R_3 and R_4 independently from each other can be either hydrogen or a C_1–C_{36} group selected from alkyl, cycloalkyl, alkaryl or aryl,

in a molar ratio of aldehyde or ketone to phenol of at least about 2:1 in the presence of an alkaline catalyst; and

(b) condensing the product of step (a) under neutral or slightly acidic conditions.

4,374,231
ADHESIVE COMPOSITION

Jos Doucet, Kessel-Lo, Belgium, assignor to Raychem Corporation, Menlo Park, Calif.

Filed May 12, 1981, Ser. No. 262,871

Claims priority, application United Kingdom, May 13, 1980, 8015914

Int. Cl.³ C08L *77/00*

U.S. Cl. 525—179 **15 Claims**

1. A hot-melt adhesive composition comprising a polyamide based on one or more dimeric fatty acids and an ethylene/acrylic acid/butyl acrylate terpolymer containing free acid groups.

4,374,232
GRAFT COPOLYMER MEMBRANE AND PROCESSES OF MANUFACTURING AND USING THE SAME

William J. Davis, Wyomissing, Pa., assignor to Gelman Sciences Inc., Ann Arbor, Mich.

Division of Ser. No. 6,909, Jan. 26, 1979, Pat. No. 4,287,275. This application May 13, 1981, Ser. No. 263,222

Int. Cl.³ C08F *279/00*

U.S. Cl. 525—243 **21 Claims**

1. A process for preparing a graft copolymer film, sheet or coating, which comprises forming a reaction mixture comprising an organic polymeric substrate and an ethylenically unsaturated monomer dissolved in an organic solvent, initiating graft copolymerization of said polymeric substrate and said monomer by forming free radicals on said polymeric substrate in said

reaction mixture and copolymerizing and crosslinking said polymeric substrate and said monomer while dissolved in said solvent to form a crosslinked graft copolymer of said polymeric substrate and said monomer in the form of a gel, subjecting said graft copolymer in said solvent to high shear forces to convert it from a gel to a thixotropic suspension containing said graft copolymer, forming said thixotropic suspension into a layer thereof on a support, and removing the solvent from said layer thereby to form the film, sheet or coating.

4,374,233

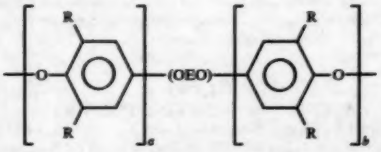
BLOCK COPOLYMERS OF POLYPHENYLENE OXIDES AND NON-STERICALLY-HINDERED HIGH MOLECULAR WEIGHT AROMATIC POLYCARBONATES

George R. Loucks, Scotia, and John R. Campbell, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,338
Int. Cl.³ C08L 71/04, 69/00
U.S. Cl. 525—394 **3 Claims**

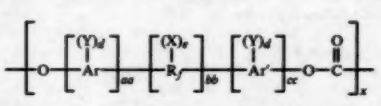
1. A block copolymer of a polyphenylene oxide and a non-sterically hindered high molecular weight polycarbonate consisting of chemically combined

(i) polyphenylene oxide blocks of the formula,



wherein independently the —(OEO)— is a divalent quinone residue, E is a divalent arene radical, either a or b is a number at least equal to 1, and the sum of a plus b is at least equal to 10, R is hydrogen, a hydrocarbon radical, a hydrocarbonoxy radical or a halohydrocarbonoxy radical,

(ii) non-sterically-hindered high molecular weight aromatic polycarbonate blocks of the formula,



wherein R_f is selected from an alkylene, alkylidene, cycloalkylene, cycloalkylidene or arylene linkage or a mixture thereof, a linkage selected from the group consisting of ether, carbonyl, amine, a sulfur or phosphorous containing linkage, Ar and Ar′ are arene radicals, Y is bromine, chlorine or a monovalent alkyl or alkoxy group, each d represents a whole number up to a maximum equivalent to the number of replaceable hydrogens substituted on the aromatic rings comprising Ar or Ar′, subject to the proviso that when d is equal to two or more, no more than one Y group is ortho-positioned relative to an —OH group, X is bromine, chlorine or a monovalent hydrocarbon group selected from the class consisting of alkyl, aryl and cycloalkyl groups, e represents a whole number of from 0 to a maximum controlled by the number of replaceable hydrogens on R_f, aa, bb and cc represent whole numbers including 0, when bb is not zero, neither aa nor cc may be zero, otherwise either aa or cc but not both may be 0, when bb is zero, the aromatic groups can be joined by a direct carbon bond, x is a number at least equal to 30, and

(iii) carbonyl radicals of the formula

4,374,234

SMALL AMOUNTS OF ALUMINUM ALKYL OR DIHYDROCARBYL MAGNESIUM IN SLURRY OLEFIN POLYMERIZATION

Phil M. Strickler, and John P. Hogan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 22, 1981, Ser. No. 266,691
Int. Cl.³ C08F 4/46, 4/78
U.S. Cl. 526—105 **11 Claims**

1. A polymerization process comprising contacting a monomer system comprising predominantly ethylene in a liquid hydrocarbon diluent under slurry polymerization conditions with a catalyst comprising chromium oxide supported on a silica-containing material, in the presence of a treating agent comprising (1) an organoaluminum compound selected from alkylaluminum compounds or alkylaluminum hydride compounds or (2) a dihydrocarbylmagnesium compound, said treating agent being present in an amount within the range of 0.2 to 1 parts by weight per million parts by weight of said diluent, said amount being an effective amount to reduce the induction period.

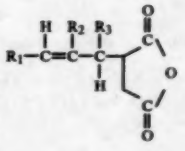
4,374,235

ANHYDRIDE CONTAINING POLYMERS DERIVED FROM ALKENYL SUCCINIC ANHYDRIDE

Billy M. Culbertson, Worthington; Larry K. Post, Columbus, both of Ohio, and Ann E. Aulabaugh, Madison, Wis., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 17, 1981, Ser. No. 234,750
Int. Cl.³ C08F 222/04, 222/06, 222/08, 222/40
U.S. Cl. 526—262 **9 Claims**

1. A copolymer comprising the free radical initiated addition polymerization product of a first monomer having the following formula:



were R_1, R_2 and R_3 each represent H, substituted or unsubstituted alkyl and substituted or unsubstituted aryl; and

a second vinyl monomer selected from the group consisting of maleic anhydride, maleimide and substituted maleimides.

4,374,236

ELASTOMERS AND PROCESS FOR THEIR PREPARATION

Alexander P. Znaiden, Slootsburg, N.Y., assignor to Avon Products, Inc., New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,635
Int. Cl.³ C08L 83/06
U.S. Cl. 528—26.5 **19 Claims**

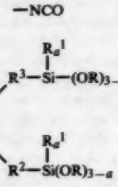
1. An elastomeric material comprising a cured mixture of a member of the group consisting of a carboxylic acid and a carboxyl-containing natural oil and an alkoxy substituted amino alkyl dimethylpolysiloxane.

4,374,237
SILANE-CONTAINING ISOCYANATE-TERMINATED POLYURETHANE POLYMERS

Mitchell H. Berger, Somerville; Walter P. Mayer, Lebanon, and Robert J. Ward, Bridgewater, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 21, 1981, Ser. No. 333,103
Int. Cl.³ C08G 18/38, 77/04, 77/26
U.S. Cl. 528—28 23 Claims

1. A curable composition comprising the reaction product of an isocyanate terminated polyurethane prepolymer having at least two urethane linkages per polymer molecule and a bis silane, said reaction product having a number average molecular weight of about 750 to about 20,000 and having 2 to about 9 functional groups, per average molecular weight, selected from the group consisting of:



(1)

(2)

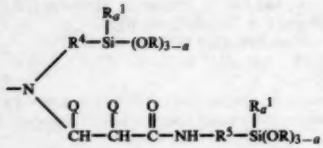
wherein

R is a lower alkyl having 1 to about 6 carbons;

R^1 is a lower alkyl having 1 to about 4 carbons;

each of R^2 and R^3 is an alkylene radical having 2 to 18 carbons or arylene radicals having 6 to 18 carbons, and

a is an integer having values of 0 to 2;



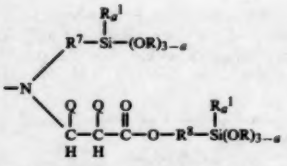
(3)

wherein

R, R^1 and a are as above,

each of R^4 and R^5 is an alkylene radical having 1 to 4 carbons, and

Q is a monovalent radical selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, phenyl, —$COOR^1$ or —CN; and



(4)

wherein

R, R^1 and a are as above,

each of R^7 and R^8 is an alkylene radical having 1 to 4 carbons, and

Q is a monovalent radical selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, phenyl, $COOR^1$ or —CN,

with the proviso that at least 0.1 percent of the total of said functional groups (1), (2), (3) and (4) is at least one of (2), (3), or (4).

4,374,238
ONE COMPONENT IN-MOLD COATING COMPOSITION COMPRISING A COMPOSITION HAVING A PLURALITY OF POLYMERIZABLE ETHYLENIC DOUBLE BONDS AND A MATERIAL CONTAINING ISOCYANATE

Henry Shanoski, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 262,981, May 20, 1981, Pat. No. 4,331,735, which is a continuation-in-part of Ser. No. 163,444, Jun. 26, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,213
Int. Cl.³ C08G 18/34
U.S. Cl. 528—50 12 Claims

1. A one component composition useful as a thermosetting in-mold coating composition comprising

(a) a liquid crosslinkable composition having an average molecular weight of up to about 5,000, having a plurality of polymerizable ethylenic double bonds, being essentially free of active hydrogen atoms and being essentially free of isocyanate groups and

(b) a material selected from the group consisting of (I) a polyisocyanate and (II) the reaction product of an excess of equivalents of a polyisocyanate and an ethylenically unsaturated compound containing —NH_2, —NH— and/or —OH groups, said reaction product being free of active hydrogen atoms, said (b) being used in an amount sufficient to secure the adhesion of said coating composition to a molded thermoset polyester resin or vinyl ester resin glass fiber composition.

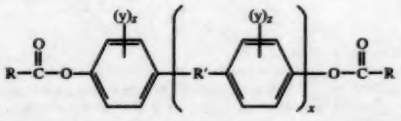
4,374,239
PROCESS FOR PREPARING POLYARYLATES

Mitchell H. Berger, Somerville; Louis M. Maresca, Belle Mead, and Ulrich A. Steiner, North Plainfield, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 126,994, Mar. 3, 1980, abandoned. This application Aug. 18, 1981, Ser. No. 293,930
Int. Cl.³ C08G 63/18, 63/20, 63/66
U.S. Cl. 528—176 12 Claims

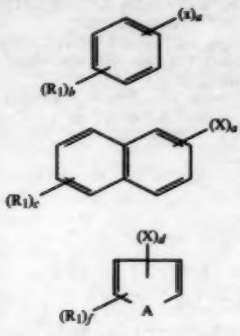
1. A process for preparing polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 dl/gm, which process comprises reacting, at a temperature of from about 260 to about 350° C:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene or cycloalkylidene readical having up to and including 9 carbon atoms, O, S, SO, SO_2, CO, x is 0 or 1; with

(b) at least one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of at least one halogenated and/or etherated substituted aromatic or heteroaromatic compound, said reaction being conducted in the absence of a catalyst, and wherein the halogenated and/or etherated substitued aromatic or hereroaromatic compound is of the following formulae:



(I)

(II)

(III)

wherein X is independently Cl, Br, F, or OR_2, a is an integer of 1 to 5, R_1 is independently alkyl of 1 to 16 carbon atoms, cycloalkyl of 6 to 18 atoms, aryl of 6 to 18 carbon atoms, or aralkyl or alkaryl of 7 to 18 carbon atoms, R_2 is independently alkyl of 1 to 16 carbon atoms or cycloalkyl of 6 to 18 carbon atoms, A is O, S, or —CH=N—, b is an integer of 0, 1, or 2, c is an integer of 0 to (8-a), d is an integer of 1 to 4, f is an integer of 0 to (4-d), with the proviso that the halogenated and/or etherified substituted aromatic compounds are free from benzylic and/or tertiary hydrogen atoms.

4,374,240

POLYMER COMPOSITIONS COMPRISING HEMIACETALS OF ADDUCTS OF ACROLEIN AND ISOCYANURIC ACID

Saul M. Cohen, Springfield, and John R. LeBlanc, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1980, Ser. No. 219,391

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ C07D 251/34; C08G 4/00

U.S. Cl. 528—230 **13 Claims**

1. A composition comprising a polyfunctional hemiacetal-reactive compound and a hemiacetal of a monohydric primary or secondary alcohol and an acrolein-isocyanuric acid adduct.

4,374,241

NITROPOLYFORMALS

Horst G. Adolph, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1982, Ser. No. 343,810

Int. Cl.³ C08G 12/04

U.S. Cl. 528—266 **7 Claims**

1. A nitropolyformal of the formula

$$H\text{-}(\text{-}OCH_2C(NO_2)_2ZC(NO_2)_2CH_2OCH_2\text{-})_nOCH_2C(NO_2)_2ZC(NO_2)_2CH_2OH$$

wherein Z is selected from the group consisting of $—CH_2—$, $—CH_2CH_2—$, $—CH_2CH_2CH_2—$, $—CH_2OCH_2—$, and $—CH_2NHCH_2—$ and wherein the average molecular weight of the homopolymer molecules is from about 1,000 to about 50,000.

4,374,242

LAYERED ORGANOARSENOUS INORGANIC POLYMERS

Martin B. Dines, Santa Ana, and Peter M. DiGiacomo, Mission Viejo, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jul. 24, 1979, Ser. No. 60,878

Int. Cl.³ C07F 7/00; C08G 79/00

U.S. Cl. 528—395 **14 Claims**

1. Process of preparing a solid, layered organoarsenous, inorganic polymer comprising reacting an organoarsenic acid with at least one tetravalent metal ion by refluxing the organoarsenic acid and tetravalent metal ion in a liquid medium.

4,374,243

POLYHEXAMETHYLENIMINE AND PROCESS FOR ITS PREPARATION

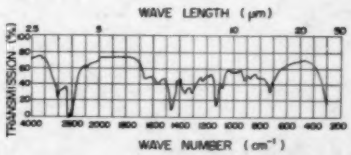
Hitoshi Yuasa, and Hirosuke Imai, both of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Division of Ser. No. 127,063, Mar. 4, 1980, Pat. No. 4,309,324, which is a division of Ser. No. 946,528, Sep. 26, 1978, Pat. No. 4,216,307. This application Sep. 25, 1981, Ser. No. 305,843

Claims priority, application Japan, Sep. 29, 1977, 52-116149; Mar. 16, 1978, 53-29265; Jun. 7, 1978, 53-67617; Jun. 9, 1978, 53-68959

Int. Cl.³ C08G 73/02; C07C 83/00

U.S. Cl. 528—422 **4 Claims**



1. A process for preparing polyhexamethylenimine having an average degree of polymerization of at least 3, which comprises condensing hexamethylenediamine at a temperature of from 50° to 300° C. in the presence of a palladium catalyst selected from the group consisting of metallic palladium and palladium compounds to form polyhexamethylenimine, removing the catalyst from the reaction mixture, and recovering the polyhexamethylenimine.

4,374,244

LINEAR QUATERNARY AMMONIUM POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kewanee Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 29,778, Apr. 13, 1979, Pat. No. 4,304,910, which is a continuation-in-part of Ser. No. 902,894, May 4, 1978, Pat. No. 4,190,644, which is a continuation-in-part of Ser. No. 744,617, Nov. 24, 1976, Pat. No. 4,089,977. This application Nov. 17, 1980, Ser. No. 206,997

Int. Cl.³ C07D 401/14; C07C 87/46

U.S. Cl. 542—476 **6 Claims**

1. A compound or mixture of compounds having the structure:

$$Y—\left[\overset{\oplus}{Z}NR'R''—\overset{\oplus}{Z}'NR'R''\right]_{X^-\ X^-}—Z—Y'$$

wherein (I) R' and R'' may be the same or different alkyl groups of from 1 to 18 carbon atoms, optionally substituted by from 1 to 2 hydroxyl groups or, (II) when taken together, will form a saturated or unsaturated ring of from 5 to 7 atoms, or (III) when taken together with N and an oxygen atom form the

N-morpholino group; wherein Z is $-CH_2CH{=}CHCH_2-$ when Z' is $-CH_2CHOHCH_2-$ or Z is $-CH_2CHOHCH_2-$ when Z' is $-CH_2CH{=}CHCH_2-$; wherein X is a halogen of atomic weight greater than 30; wherein Y and Y' may be either the same or different and may be either X or —NR'R"; and wherein n is an integer of from 2 to 20.

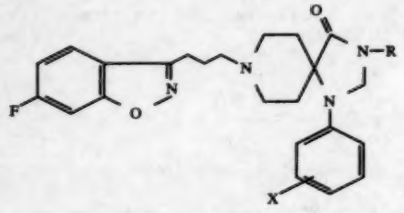
4,374,245

8-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-1-PHENYL-1,3,8-TRIAZASPIRO[4.5]DECAN-4-ONE

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 9, 1982, Ser. No. 366,246
Int. Cl.³ C07D 413/14
U.S. Cl. 546—20 **3 Claims**

1. A compound of the formula



wherein R is hydrogen or loweralkyl; X is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; the optical antipods thereof, or pharmaceutically acceptable acid addition salts thereof.

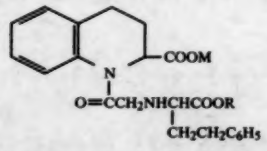
4,374,246

1-N-[(1-CARBOXY-3-PHENYLPROPYL)GLYCYL]-1,2,3,4-TETRAHYDROQUINOLINE-2-CARBOXYLIC ACID COMPOUNDS

George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Jun. 18, 1981, Ser. No. 275,064
Int. Cl.³ C07D 215/12, 215/16
U.S. Cl. 546—156 **3 Claims**

1. A compound of the formula:



wherein
M is hydrogen or sodium and
R is hydrogen or ethyl.

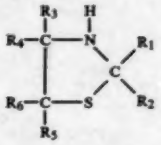
4,374,247

PROCESS FOR PREPARING 2,2-DISUBSTITUTED THIAZOLIDINES

Yasuko Osawa, Tokyo, and Saburo Uchikuga, Yokohama, both of Japan, assignors to Sogo Pharmaceutical Co., Ltd., Sagamihara, Japan

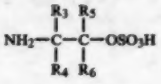
Filed Jun. 4, 1980, Ser. No. 156,488
Claims priority, application Japan, Dec. 7, 1979, 54-158130
Int. Cl.³ C07D 277/04, 277/60
U.S. Cl. 548—146 **5 Claims**

1. A process for preparing a 2,2-disubstituted thiazolidine having the formula



wherein: R_1 and R_2 are each an alkyl group of from one to five carbon atoms or phenyl group, or R_1 is joined with R_2 to form a cyclohexane ring; and R_3, R_4, R_5, and R_6 are hydrogen or lower alkyl, the process comprising the step of

reacting aminoalkyl hydrogensulfate of the formula



wherein: R_3, R_4, R_5 and R_6 are defined above,

with a compound having hydrosulfide ion (^-SH) and selected from the group consisting of sodium hydrosulfide, potassium hydrosulfide, sodium sulfide and potassium sulfide,

in the presence of ketone capable of reacting with said aminoalkyl hydrogensulfate to produce said thiazolidine, said ketone having the formula

wherein: R_1 and R_2 are defined above, and thereby obtaining said thiazolidine.

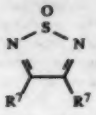
4,374,248

3,4-DISUBSTITUTED-1,2,5-THIADIAZOLE-1-OXIDE COMPOUNDS

Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 240,034, Mar. 3, 1981, which is a continuation-in-part of Ser. No. 163,831, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 117,182, Jan. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 72,517, Sep. 4, 1979, abandoned. This application Jun. 23, 1981, Ser. No. 276,586
Int. Cl.³ C07D 285/10
U.S. Cl. 548—135 **3 Claims**

1. A compound of the formula



wherein each R^7 is halogen, (lower)alkoxy or (lower)alkylthio, or phenoxy or phenylthio which may contain 1 or 2 substituents selected from halogen, (lower)alkyl, (lower)alkoxy and nitro.

4,374,249

[4R]-3-(ω-AROYLPROPIONYL)-4-THIAZOLIDINECARBOXYLIC ACIDS AND ESTERS

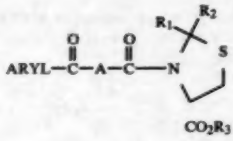
Daniel B. Moran, Suffern, and Jay D. Albright, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1980, Ser. No. 219,766

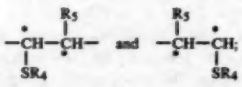
Int. Cl.³ C07D 277/04

U.S. Cl. 548—201 **20 Claims**

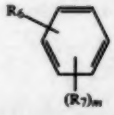
1. A compound selected from the group consisting of those of the formulae:



wherein A is



R_1 and R_2 are selected from the group consisting of hydrogen, lower alkyl (C_1–C_3), phenyl and mono substituted phenyl, wherein the substituents are chloro, fluoro, trifluoromethyl, lower alkyl (C_1–C_4), and methoxy, with the proviso that when R_1 is phenyl or substituted phenyl, R_2 must be hydrogen; R_3 is hydrogen, or lower alkyl having from 1–4 carbon atoms; R_4 is selected from the group comprising hydrogen, benzoyl and lower alkanoyl (C_1–C_4); R_5 is hydrogen and lower alkyl having from 1–3 carbon atoms; ARYL is selected from the group consisting of 1-naphthyl, 2-naphthyl, 4-chloro-1-naphthyl, 4-methoxy-1-naphthyl, 5,6,7,8-tetrahydro-1-naphthyl, 5,6,7,8-tetrahydro-2-naphthyl, 4-biphenylyl, 5-indanyl, 4-indanyl and moieties of the formula:



wherein R_6 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl, cyano, phenoxy, halophenoxy, phenylthio, halophenylthio, alkyl having from 1–4 carbon atoms and alkoxy having from 1–4 carbon atoms; where m is zero, one or two; and the pharmacologically acceptable cationic salts thereof.

4,374,250

METHOD OF PRODUCING BENZIMIDAZOLONE

Tsuneaki Hirashima, and Toshiyuki Miyata, both of Sakai, Japan, assignors to Osaka Municipal Government, Japan

Filed Jun. 22, 1981, Ser. No. 275,618

Claims priority, application Japan, Jun. 23, 1980, 55-84701; Dec. 30, 1980, 55-186986

Int. Cl.³ C07D 235/26

U.S. Cl. 548—305 **14 Claims**

1. A method of producing benzimidazolone which comprises reacting a reactant selected from the group consisting of o-nitroaniline or o-dinitrobenzene with carbon monoxide in a solvent in the presence of selenium, a base selected from the group consisting of tertiary amines, amides and inorganic bases selected from the group consisting of hydroxides, oxides, carbonates, bicarbonates and sulfides of alkali metals and alkaline earth metals, and water, said reactant containing no additional substituents or containing substituents which are substantially inert in said reaction.

4,374,251

IMIDAZOLINE CONTAINING IMIDAZOLES

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

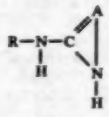
Division of Ser. No. 7,755, Jan. 30, 1979, Pat. No. 4,260,744, which is a division of Ser. No. 778,812, Mar., 1977, Pat. No. 4,153,793, which is a division of Ser. No. 619,724, Oct. 6, 1975, Pat. No. 4,035,374, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Nov. 14, 1980, Ser. No. 206,819

Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 3551/73

Int. Cl.³ C07D 233/88

U.S. Cl. 548—309 **9 Claims**

1. A compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms an imidazoline ring, said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is an imidazole ring, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,374,252

BENZYL 5-METHYL-4-IMIDAZOLECARBOXYLATE

Harold Graboyes, Philadelphia; Thomas J. Kasper, Media, and Praful D. Vaidya, Warminster, all of Pa., assignors to SK&F Lab Co., Carolina, P.R.

Division of Ser. No. 195,278, Oct. 8, 1980, Pat. No. 4,328,349. This application Dec. 10, 1981, Ser. No. 329,164

Int. Cl.³ C07D 233/90

U.S. Cl. 548—343 **1 Claim**

1. Benzyl 5-methyl-4-imidazolecarboxylate.

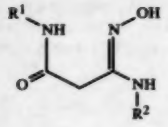
4,374,253
METHOD FOR PREPARING 1-ARYL-3-ARYLAMINO-2-PYRAZOLIN-5-ONES FROM N-ARYL-3-ARYLAMINO-3-OXIMINOPROPIONAMIDES

Chang-Kyu Kim, Rochester, and Cataldo A. Maggiulli, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,622
Int. Cl.³ C07D 231/52
U.S. Cl. 548—360 23 Claims

1. A method for preparing a 1-aryl-3-arylamino-2-pyrazolin-5-one, which method comprises the steps of:

(a) reacting an N-aryl-3-arylamino-3-oximinopropionamide, represented by the structural formula



wherein each of R^1 and R^2 is phenyl or phenyl substituted with at least one halo, nitro, alkyl, alkoxy, sulfamoyl or substituted sulfamoyl group, with an acylating agent in an inert solvent to form an N-aryl-3-arylamino-3-(O-acyloximino)propionamide;

(b) heating the N-aryl-3-arylamino-3-(O-acyloximino)propionamide in contact with a strong acid catalyst and a dehydrating agent in an inert solvent to a temperature sufficient to effect dehydrative cyclization and rearrangement of the N-aryl-3-arylamino-3-(O-acyloximino)propionamide to form a 3-(N-acylarylamino)-1-aryl-2-pyrazolin-5-one; and

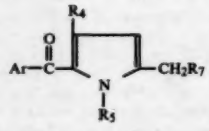
(c) heating the 3-(N-acylarylamino)-1-aryl-2-pyrazolin-5-one in contact with an acid in water and a lower alkanol to effect hydrolysis of the 3-(N-acylarylamino)-1-aryl-2-pyrazolin-5-one to form the 1-aryl-3-arylamino-2-pyrazolin-5-one.

4,374,254
PROCESS FOR PRODUCING SUBSTITUTED PYRROLES

James T. F. Kao, and Wayne D. Jensen, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 23, 1981, Ser. No. 228,174
Int. Cl.³ C07D 207/323
U.S. Cl. 548—527 10 Claims

1. A process for preparing a substituted pyrrole compound of the formula



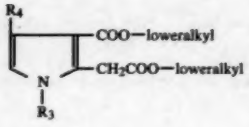
wherein the foregoing formula, said R_4 and R_5 each are independently selected from loweralkyl, and said R_7 is COOM in which M is an alkali metal, and Ar is selected from phenyl, thienyl, 5-methylthienyl, monosubstituted phenyl and polysubstituted phenyl, each substituent of said substituted phenyls being a member selected from the group consisting of halo, loweralkyl, trifluoromethyl, loweralkoxy, nitro, amino, cyano and methylthio, which comprises the steps of (a) contacting a crude aqueous mixture containing a 1-R_5-4-R_4-5-aroylpyrrole-2-acetic acid with a mixed organic extractant therefor said mixed organic extractant comprising a mixture of an organic hydrocarbon compound selected from benzene, xylene, and toluene and a lower alkanol selected from methanol, ethanol and propanol so that the pyrrole is extracted into the organic phase, (b) separating the phases, (c) treating the organic phase with a basic aqueous extractant selected from an aqueous alkali metal or alkaline earth metal hydroxide so that the pyrrole salt formed is extracted into the aqueous phase, (d) separating the phases, (e) contacting the pyrrole with a decolorizing agent and (f) recovering the resulting substituted pyrrole compound of the general formula above.

4,374,255
PROCESS FOR PRODUCING SUBSTITUTED PYRROLES

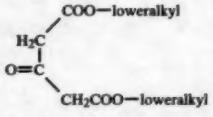
James T. F. Kao, and Robert E. Farritor, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 137,249, Apr. 4, 1980, abandoned. This application Mar. 2, 1981, Ser. No. 239,431
Int. Cl.³ C07D 207/337
U.S. Cl. 548—531 7 Claims

1. In a process for the preparation of a loweralkyl 1,4-diloweralkyl-3-loweralkoxycarbonyl-pyrrole-2-acetate of the formula:



by reacting a chloromethyl loweralkyl ketone of the formula: $Cl—CH_2—CO—R_4$, with a diloweralkyl acetone dicarboxylate of the formula:



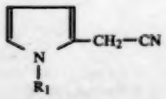
and an aqueous solution of a loweralkylamine of the formula: R_3NH_2, wherein the foregoing formulas said R_3 and said R_4 represent loweralkyl, the improvement comprising carrying out the reaction in the presence of a lower alkanol having from 1 to about 6 carbon atoms at a molar ratio of from about 0.1 to about 18 moles of said alkanol to each mole of said diloweralkyl acetone dicarboxylate.

4,374,256
PROCESS FOR THE PREPARATION OF PYRRYL-2-ACETONITRILE

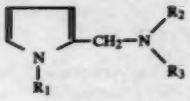
James T. F. Kao, and Karl E. Wiegand, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 582,860, Jun. 2, 1975, abandoned. This application Feb. 2, 1979, Ser. No. 8,943
Int. Cl.³ C07D 207/337
U.S. Cl. 548—561 6 Claims

1. In a process for the production of pyrryl-2-acetonitriles of the formula



wherein R_1 is hydrogen or an alkyl group having 1–4 carbon atoms by reacting a dialkyl-(pyrryl-2-methyl)-amine corresponding to the formula



wherein R_1 is defined as above and R_2 and R_3 are independently selected from the same or different alkyl groups having 1 to about 4 carbon atoms with an alkyl halide alkylating agent to form the corresponding quaternary salt and displacing the amine group on said salt with aqueous alkali metal cyanide in the presence of a water-immiscible solvent in which the product pyrryl-2-acetonitrile is soluble, the improvement consisting essentially of alkylating said dialkyl-(pyrryl-2-methyl)-amine with methyl chloride while maintaining a temperature in the range of about 30° to about 40° C. and the pressure at from 20 to about 150 psig to form the corresponding quaternary salt and displacing the amine group from said salt by reaction of about 110 to 180 percent by weight of the stoichiometric amount of said alkali metal cyanide based on said dialkyl-(pyrryl-2-methyl)-amine at a temperature of about 75° to about 100° C. in the presence of from about 1.5 to about 10 parts of said solvent per part of said dialkyl-(pyrryl-2-methyl)-amine, said exothermic displacement reaction being controlled by addition to a mixture of said aqueous alkali metal cyanide and water-immiscible solvent of from about 3.5 to about 10 parts by weight of the quaternary salt aqueous phase per part of said mixture.

4,374,257

NOVEL ETHERS CONTAINING A LACTONE GROUP AND A CHIRAL ATOM

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Andre Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

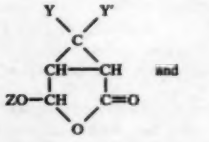
Division of Ser. No. 21,833, Mar. 19, 1979, Pat. No. 4,265,817. This application Feb. 6, 1981, Ser. No. 232,117

Claims priority, application France, Mar. 17, 1978, 78 07778

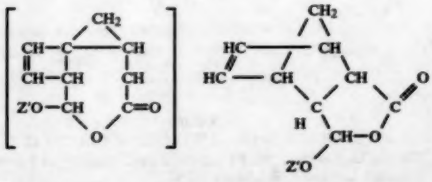
Int. Cl.³ C07D *307/93, 307/94*

U.S. Cl. 549—302 **6 Claims**

1. An ether containing chiral atoms having a formula selected from the group consisting of



and



wherein Y and Y′ are individually selected from the group consisting of hydrogen, fluorine, bromine, chlorine and alkyl of 1 to 6 carbon atoms, Z is selected from the group consisting of a α-cyano-3-phenoxy-benzyl and α-ethynyl-3-phenoxy-benzyl and Z′ is selected from the group consisting of 2-methyl-3-(2-propen-1-yl)-4-oxo-cyclopent-2-enyl, α-methyl-3-phenoxy-benzyl and 2-isopropyl-5-methyl-cyclohexyl with the proviso that Z is not (R) or (S) α-cyano-3-phenoxy-benzyl when Y and Y′ are both methyl.

4,374,258

CHROMAN-6-OL DERIVATIVES USEFUL FOR STABILIZING PLASTICS

Michael Horner, Neustadt, and Gernot Teege, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

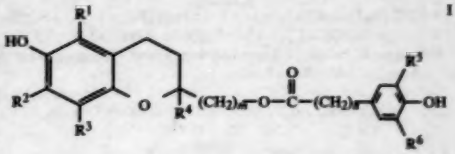
Filed Jan. 28, 1982, Ser. No. 343,762

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103740

Int. Cl.³ C07D *311/72*

U.S. Cl. 549—407 **1 Claim**

1. A chroman derivatives of the general formula I



I

where R^1, R^2, R^3 and R^4 are each H or C_1-C_4-alkyl, R^5 is sec.-C_3-C_8-alkyl or tert.-C_4-C_8 alkyl, R^6 is H or R^5, m is 1, 2 or 3, and n is 0, 1, 2 or 3.

4,374,259

PROCESS FOR CONVERTING SUBSTITUTED ETHYLENE CARBONATES INTO SUBSTITUTED ETHYLENE OXIDES USING TIN CATALYSTS

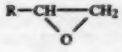
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 920,906, Jun. 29, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 95,031

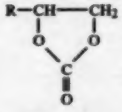
Int. Cl.³ C07D *317/36*

U.S. Cl. 549—518 **25 Claims**

1. A process for the preparation of a substituted ethylene epoxide of the formula



wherein R is alkyl, aryl, substituted alkyl or substituted aryl which comprises heating the corresponding substituted ethylene carbonate having the formula



wherein R is defined as above in the presence of a catalytic amount of an organo-tin catalyst wherein the tin is tin(IV).

4,374,260

ETHYLENE OXIDE PRODUCTION

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 893,726, Apr. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 719,042, Aug. 30, 1976, Pat. No. 4,097,414. This application Jun. 24, 1982, Ser. No. 391,651

Int. Cl.³ C07D *301/10*

U.S. Cl. 549—534 **15 Claims**

1. An improved method for epoxidizing ethylene to ethylene oxide in the vapor phase, which comprises the step of intimately contacting ethylene with a molecular oxygen-containing epoxidizing agent in the presence of a cesium-modified,

supported silver catalyst at epoxidizing temperatures from about 200° C. to about 300° C., wherein the catalyst is prepared by contacting a porous, inorganic, catalyst support material with an impregnating solution; and, heating the impregnated support material at temperatures from about 50° C. to 300° C. to evaporate volatiles and activate said catalyst, wherein said impregnating solution comprises an effective amount of a cesium salt in solution with a silver carboxylate/amine complex of a silver carboxylate dissolved in a solubilizing amount of an amine-containing complexing agent comprising diethylenetriamine.

4,374,261

1-ETHYL-1,4-DIHYDRO-6-(2-NAPHTHYL)-4-OXO-NICOTINIC ACID AND ESTERS THEREOF

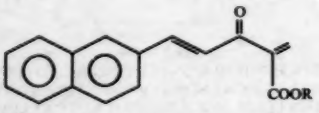
Alexander E. Wick, Le Mesnil-le Roy, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 235,870, Feb. 19, 1981, which is a division of Ser. No. 166,506, Jul. 7, 1980. This application Oct. 28, 1981, Ser. No. 315,780

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—51 **1 Claim**

1. A compound of the formula



wherein R is hydrogen or C_{1-6}-alkyl.

4,374,262

PREPARATION OF HYDROXY AROMATIC CARBOXYLIC ACIDS AND ESTER DERIVATIVES THEREOF

James L. McGinnis, Middlesex, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,201

Int. Cl.³ C07C *69/94*

U.S. Cl. 560—56 **27 Claims**

1. A process for preparing the ester of a hydroxy aromatic carboxylic acid which comprises reacting a hydroxy aromatic halide with carbon monoxide in the presence of (i) a reactive alcohol solvent wherein said alcohol has from 1 to about 8 carbons, and (ii) a catalytic amount of a Group VIII catalyst, under carbonylation reaction conditions sufficient to produce the corresponding hydroxy ester of said hydroxy aromatic carboxylic acid.

4,374,263

PROCESS FOR THE PRODUCTION OF ESTERS IN THE PRESENCE OF A HETEROGENEOUS ESTERIFICATION CATALYST

Ronald D. Hancock, Weybridge, and Robert Mackison, Epsom, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 24, 1980, Ser. No. 200,558

Claims priority, application United Kingdom, Oct. 27, 1979, 7937331

Int. Cl.³ C07C *67/08*

U.S. Cl. 560—204 **9 Claims**

1. A process for the production of esters which process comprises reacting under esterification reaction conditions a carboxylic acid or an anhydride thereof with an alcohol or a phenol or a derivative thereof in the presence of a catalytically effective amount of an inorganic oxide selected from the group consisting of silica, alumina, titania, zirconia, glass, sepiolite and zeolitic molecular sieves and having bonded to the surface thereof by reaction with surface hydroxyl groups present thereon the group:

$$\equiv Si—R—CH_2SO_3H \qquad (I)$$

wherein R is a divalent radical containing up to 20 carbon atoms and at least one of the unsatisfied valencies of the silicon atom is linked to the inorganic oxide, the remainder, if any, being satisfied by either halogen atoms or organic radicals containing up to 20 carbon atoms or hydrolysis products thereof.

9. A process according to claim 1, 2 or 3 wherein the alcohol is 2-ethyl hexanol, the carboxylic acid is adipic acid and the ester so produced is di-(2-ethyl hexyl) adipate.

4,374,264

PROCESS FOR THE PREPARATION OF γ-UNSATURATED CARBOXYLATES

Errol J. McGarry, Eltham North, Australia, assignor to ICI Australia Limited, Melbourne, Australia

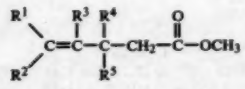
Filed May 18, 1981, Ser. No. 265,073

Claims priority, application Australia, Jun. 2, 1980, PE3836

Int. Cl.³ C07C *69/533*

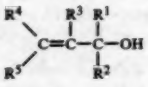
U.S. Cl. 560—205 **9 Claims**

1. A process for the preparation of a γ-unsaturated carboxylate of formula I



I

wherein R^1, R^2, R^3, R^4 and R^5 are independently chosen from hydrogen and C_1 to C_6 alkyl, by the reaction of an allyl alcohol of formula II



II

with trimethyl orthoacetate in the presence of an acidic catalyst which process comprises:

(a) slowly adding the allyl alcohol of formula II over a period of at least 30 minutes to a stoichiometric excess of trimethyl orthoacetate heated to a temperature at or near its boiling point;

(b) distilling portion of the excess trimethyl orthoacetate from the reaction mixture until the reaction mixture reaches a temperature in the range from 130° to 160° C.; and

(c) maintaining the temperature of the reaction mixture in the range from 130° to 160° C. to complete the reaction.

4,374,265

PREPARATION OF ETHYLIDENE DIACETATE

Thomas H. Larkins, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,830

Int. Cl.³ C07C *67/00, 69/16*

U.S. Cl. 560—263 **6 Claims**

1. Process for the preparation of ethylidene diacetate which comprises hydrogenating acetic anhydride at about 100° to 200° C. and about 250 to 3000 psig in the presence of a catalytic amount of a heterogeneous palladium catalyst and a silica-alumina material which contains about 5 to 40 weight percent alumina and in the substantial absence of strong protonic acid.

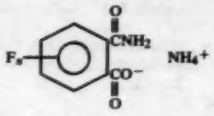
4,374,266

AMMONIUM SALTS OF FLUOROPHTHALAMIC ACIDS AND METHOD OF PREPARATION

Michael J. Fifolt, Grand Island, N.Y., and Arthur M. Foster, Birmingham, Mich., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,672
Int. Cl.³ C07C 101/42
U.S. Cl. 562—456 6 Claims

1. Ammonium salts of fluorophthalamic acids, characterized by the formula



wherein n is 1 or 2.

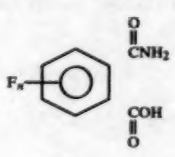
4,374,267

FLUOROPHTHALAMIC ACIDS AND METHOD OF PREPARATION

Michael J. Fifolt, Grand Island, N.Y., and Arthur M. Foster, Birmingham, Mich., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,674
Int. Cl.³ C07C 101/42
U.S. Cl. 562—456 6 Claims

1. Fluorophthalamic acids characterized by the formula



wherein n is 1 or 2.

4,374,268

CATALYTIC OXYDEHYDROGENATION PROCESS

Chelliah Daniel, and Phyllis L. Brusky, both of Columbus, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 10, 1980, Ser. No. 129,005
Int. Cl.³ C07C 51/377, 57/05, 67/317, 69/54
U.S. Cl. 562—599 4 Claims

1. In a process for the catalytic conversion of isobutyric acid or a lower alkyl ester thereof to the corresponding α,β-ethylenically unsaturated derivative via the oxydehydrogenation reaction wherein an iron phosphate catalyst is contacted with a gaseous feed stream containing said acid or ester substrate and oxygen at a temperature between about 300° and 500° C.; the improvement of effecting said oxygehydrogenation reaction in the presence of a modified iron phosphate catalyst having the gram-atom empirical formula $FeP_{1\text{-}2}M_{0.01\text{-}1}O_x$ in which M represents cobalt or lanthanum and x represents the number of oxygen atoms bound to the other elements in their respective states of oxidation in the catalyst.

4,374,269

OXYDEHYDROGENATION PROCESS FOR PREPARING METHACRYLIC ACID AND ITS LOWER ALKYL ESTERS

Ferdinand A. Ruszala, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 19, 1981, Ser. No. 322,497
Int. Cl.³ C07C 51/377, 57/05, 67/317, 69/54
U.S. Cl. 562—599 3 Claims

1. A process for the catalytic conversion of isobutyric acid or a lower alkyl ester thereof to the corresponding α,β-olefinically unsaturated derivative by oxydehydrogenation wherein a catalyst is contacted with a gaseous feed stream containing said acid or ester and molecular oxygen at a temperature between about 300° and 500° C. which comprises using as catalyst a material having the gram-atom empirical formula $U_aNb_bO_x$ wherein a is 0.3 to 3, b is 0.7 to 2, and x is determined by satisfying the sum of the unshared positive valences of the other elements shown in the formula.

4,374,270

OXYDEHYDROGENATION PROCESS FOR PREPARING METHACRYLIC ACID AND ITS LOWER ALKYL ESTERS

Ferdinand A. Ruszala, Columbus, and Thomas J. Weeks, Jr., Arlington, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 7, 1981, Ser. No. 328,289
Int. Cl.³ C07C 51/377, 57/05, 67/317, 69/54
U.S. Cl. 562—599 6 Claims

1. A process for the catalytic conversion of isobutyric acid or a lower alkyl ester thereof to the corresponding α,β-olefinically unsaturated derivative by oxydehydrogenation wherein a catalyst is contacted with a gaseous feed stream containing said acid or ester and molecular oxygen at a temperature between about 300° and 500° C. which comprises using as catalyst a material having the gramatom empirical formula FeM_aO_x wherein a is a number from 0.5 to 3 and M is at least two members selected from the group consisting of antimony, niobium, tantalum and tungsten and x represents a number determined by the valence requirements of the other elements present.

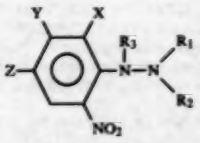
4,374,271

NITROPHENYLHYDRAZINE COMPOUNDS

Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 529,655, Dec. 4, 1974, abandoned. This application Apr. 4, 1979, Ser. No. 26,986
Int. Cl.³ C07C 109/04
U.S. Cl. 564—310 9 Claims

1. A compound of the formula



wherein X is selected from hydrogen and nitro, Y is halo, Z is selected from halo and trifluoromethyl, R_1 is lower alkyl, and R_2 and R_3 are each selected from hydrogen and lower alkyl.

4,374,272

PROCESS FOR PREPARING 2-(4'-HYDROXYARYL)-2-(4'-AMINOARYL)-PROPANES

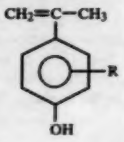
Teruo Yuasa; Noboru Yamazaki, both of Nagoya, and Yoshio Morimoto, Tokai, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 7, 1979, Ser. No. 92,175
Claims priority, application Japan, Nov. 8, 1978, 53-137528
Int. Cl.³ C07C 87/64
U.S. Cl. 564—315 10 Claims

1. A process for preparing 2-(4'-hydroxyaryl)-2-(4'-aminoaryl)-propanes comprising reacting

(A) at least one isopropenyl phenol compound selected from

the group consisting of isopropenyl phenol derivatives of the formula:



wherein R represents a hydrogen or halogen atom or an alkyl, aryl, nitro, nitrile, acyl, acyloxy or amino group, and di- to eicosa-mers of said isopropenyl phenol derivatives with

(B) an aromatic amine selected from the group consisting of aniline, o-chloroaniline, 2,5-dichloroaniline, o-nitroaniline, o-toluidine, 2,6-xylidine, o-isopropylaniline, N-methylaniline, o-aminophenol, and diphenylamine, in the presence of 0.00001 to 0.008 mole, per mole of said isopropenylphenol compound (A) calculated as a monomer, of an acid catalyst, wherein the amount of the aromatic amine (B) is 1.0 to 2.0 moles per mole of the isopropenyl phenol compound (A) calculated as a monomer.

4,374,273

METHOD FOR PRODUCTION OF METHYLAMINES

George E. Heinsohn, Cecil County, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 28, 1981, Ser. No. 258,387
Int. Cl.³ C07C *85/02, 85/06;* B01J *29/06*
U.S. Cl. 564—479 3 Claims

1. In the catalytic preparation of methylamines from methanol and ammonia using an aluminosilicate catalyst, a method for controlling the relative yields of monomethyl-, dimethyl- and trimethylamine, which method comprises using a catalyst comprising an amorphous aluminosilicate containing about 0.1–6%, by weight, of sodium, potassium, lithium, barium or strontium atoms as a result of treating an amorphous aluminosilicate with a corresponding metal hydroxide, the greater the added metal content of the catalyst, the greater the amount of monomethylamine produced.

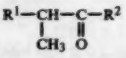
4,374,274

PREPARATION OF α-METHYLSUBSTITUTED CARBONYL COMPOUNDS

Gerd Heilen, Spcyer; Klaus Halbritter, Mannheim, and Walter Gramlich, Edingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

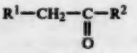
Filed Sep. 11, 1980, Ser. No. 186,130
Int. Cl.³ C07C *45/45*
U.S. Cl. 568—313 9 Claims

1. A process for the preparation of a carbonyl compound of the general formula I



(I)

where R^1 and R^2 are straight-chain or branched alkyl of 1 to 8 carbon atoms or are aryl or aralkyl, R^1 may also be H and R^1 and R^2 together with the carbon atoms between them may also be members of an alicyclic ring, wherein a ketone of the general formula II



(II)

is reacted with formaldehyde at 50°–230° C. in the presence of hydrogen and of a catalyst in which the active constituents are

(a) a phosphate of one or more of the metals zirconium, titanium, hafnium and tin or a mixture of such phosphates and

(b) metallic palladium deposited on this phosphate (or phosphate mixture).

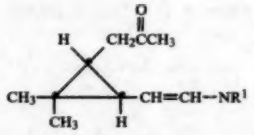
4,374,275

KETOENAMINE PYRETHROID INTERMEDIATES

Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 259,725, May 1, 1981, Pat. No. 4,324,915.
This application Oct. 28, 1981, Ser. No. 315,834
Int. Cl.³ C07C *45/40*
U.S. Cl. 568—351 4 Claims

1. A process for the preparation of 2,2-dimethyl-3-(2-oxopropyl)cyclopropanecarbaldehyde which comprises treating 2,2-dimethyl-3-(2-oxopropyl)cyclopropylacetaldehyde with a trialkylsilyldialkylamine, $(R^3)_3SiNR^1R^2$, in which R^1 and R^2 each independently is an alkyl group containing from 1 to 4 carbon atoms and each R^3 is independently an alkyl group containing from 1 to 4 carbon atoms followed by ozonolysis of the resulting compound of the formula I



I

to the desired 2,2-dimethyl-3-(2-oxopropyl)cyclopropanecarbaldehyde.

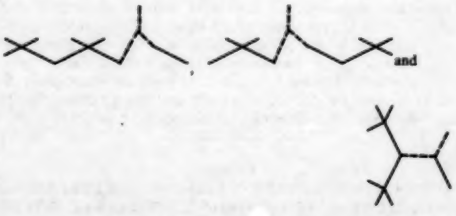
4,374,276

NOVEL BRANCHED CHAIN KETONES AND THE PROCESS FOR PREPARING SAME

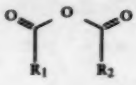
Richard M. Boden, Monmouth Beach, and Theodore J. Tyszkiewicz, Sayreville, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,868
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ A61K *7/46;* C07C *2/52*
U.S. Cl. 568—398 6 Claims

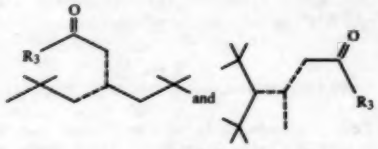
1. A product prepared by the process of (a) trimerizing isobutylene to form triisobutylene, a mixture of substances defined according to the structures:



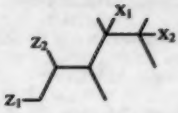
wherein in each of the molecules one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and (b) reacting the resulting triisobutylene composition of matter with an alkanoic acid anhydride having the structure:



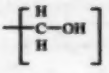
wherein R_1 and R_2 are the same or different and are each selected from the group consisting of methyl and ethyl, in the presence of a Lewis acid catalyst thereby producing a mixture of compounds comprising the compounds defined according to the structures:



wherein R_3 represents methyl or ethyl and in each of the molecules one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent a carbon-carbon single bond.



wherein one of X_1 or X_2 is hydrogen and the other of X_1 or X_2 is methyl; and wherein one of Z_1 or Z_2 is hydrogen and the other of Z_1 or Z_2 is hydroxymethyl having the structure:



or carboxaldehyde having the structure:

4,374,277

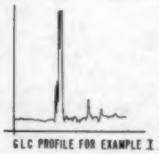
ALIPHATIC C_{11} BRANCHED CHAIN ALDEHYDES AND ALCOHOLS, PROCESS FOR PREPARING SAME AND USES THEREOF IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMES, COLOGNES AND/OR PERFUMED ARTICLES

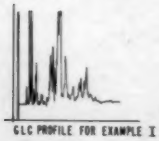
Richard M. Boden, Moanouth Beach, and John H. Geiger, Jr., Lakewood, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

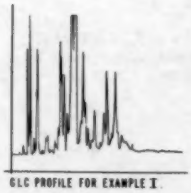
Division of Ser. No. 233,861, Feb. 12, 1981, Pat. No. 4,304,689. This application Sep. 25, 1981, Ser. No. 305,533

Int. Cl.³ C07C 47/02, 45/50

U.S. Cl. 568—448 **5 Claims**







1. A compound defined according to the structure:

4,374,278

HYDROFORMYLATION CATALYST REACTIVATION

David R. Bryant, and Richard A. Galley, both of South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 120,101, Feb. 28, 1980, Pat. No. 4,297,239, which is a continuation-in-part of Ser. No. 58,123, Jul. 16, 1979, abandoned. This application Jul. 15, 1981, Ser. No. 283,637

Int. Cl.³ C07C 45/50

U.S. Cl. 568—454 **29 Claims**

1. In a hydroformulation process for producing aldehydes by hydroformylating an olefin containing from 2 to 20 carbon atoms with hydrogen and carbon monoxide in the presence of a hydroformylation reaction medium comprising a soluble rhodium complex catalyst and at least 10 moles of free triarylphosphine per mole of catalytically active rhodium present in said medium, the improvement which comprises employing as a source of rhodium for said catalyst, a rhodium complex concentrate having been produced by a process which comprises concentrating a spent hydroformylation reaction medium that contains a partially deactivated rhodium complex catalyst, free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products, into at least two separate material streams so as to remove free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products from said spent hydroformylation reaction medium by means of distillation at temperatures of about 20° C. to about 350° C. and at pressures of about 1000 mm Hg. to about 1×10^{-6} mm Hg., wherein one stream is said rhodium complex concentrate distillation residue containing a major amount of the rhodium of said catalyst and which has been concentrated to about 0.1 to about 30 percent by weight of said spent hydroformylation reaction medium, and the other material stream or streams consist essentially of one or more of the distilled volatile components of said spent hydroformylation reaction medium.

4,374,279
PROCESS FOR THE PREPARATION OF DICUMYL PEROXIDE

Giuseppe Messina, Alghero; Mario D. Moretti, Sassari, and Loreno Lorenzoni, Porto Torres, all of Italy, assignors to Enteco Impianti S.p.A., Milan, Italy

Filed Nov. 27, 1981, Ser. No. 325,338
Claims priority, application Italy, Dec. 2, 1980, 26346 A/80
Int. Cl.³ C07C 179/06
U.S. Cl. 568—558 7 Claims

1. A process for the preparation of dicumyl peroxide which comprises:

(a) reacting cumene hydroperoxide with a molar excess of methyl cumyl ether in the presence of from 0.05% to 5% by wt. with respect to the weight of cumene hydroperoxide of a catalyst consisting of boron trifluoride or boron trifluoride etherates,

(b) maintaining the temperature in the reaction medium from about 100° C., and

(c) removing the methanol which forms during the reaction from the reaction mixture, while the reaction proceeds.

4,374,280
PROCESS FOR THE PREPARATION OF DICUMYL PEROXIDE

Giuseppe Messina, Alghero; Mario D. Moretti, Sassari, and Loreno Lorenzoni, Porto Torres, all of Italy, assignors to Enteco Impianti S.p.A., Milan, Italy

Filed Nov. 23, 1981, Ser. No. 324,144
Claims priority, application Italy, Feb. 12, 1980, 26345 A/80
Int. Cl.³ C07C 179/06
U.S. Cl. 568—558 7 Claims

1. A process for the preparation of dicumyl peroxide which comprises

(a) reacting cumene hydroperoxide with a molar excess of dimethyl phenyl carbinol in the presence of from 0.5% to 2% by wt. with respect to the weight of cumene hydroperoxide of a catalyst consisting of phosphorous halides or oxyhalides,

(b) maintaining the temperature in the reaction medium from about 20° to about 100° C., and

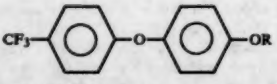
(c) removing the water which forms from the reaction mixture while the reaction proceeds.

4,374,281
PROCESS FOR THE MANUFACTURE OF HYDROQUINONE-MONOPHENYL ETHERS

Reinhart Geuss, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

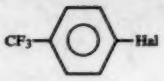
Filed May 8, 1981, Ser. No. 261,794
Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3018004
Int. Cl.³ C07C 41/16
U.S. Cl. 568—637 2 Claims

1. In a process for the manufacture of hydroquinone-monophenyl ethers of their alkali metal salts of the formula



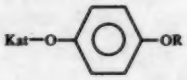
I

in which R is hydrogen or an alkali metal cation by reacting halogen compounds of the formula



II

in which Hal is chlorine or bromine, with a hydroquinone derivative of the formula



V

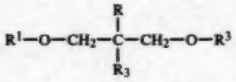
in which Kat is sodium or potassium, in N-methyl pyrrolidone, the improvement which comprises carrying out the reaction at a temperature of from 230° to 260° C. and with an at least 15% excess of hydroquinone derivative.

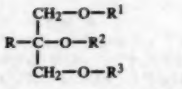
4,374,282
ETHERS OF POLYOLS, THEIR PREPARATION AND USE

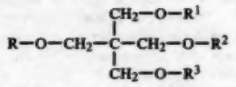
Paul Maldonado, St. Symphorien D'Ozon; Robert Nouguier, Plan de Cuques; Jean-Claude Fayard, Lyons, and Robert Leger, Grigny, all of France, assignors to Elf France, Paris, France

Filed Oct. 15, 1980, Ser. No. 197,205
Claims priority, application France, Oct. 15, 1979, 79 25559
Int. Cl.³ C07C 41/01
U.S. Cl. 568—672 9 Claims

1. A process for preparing ethers of polyols of the formula







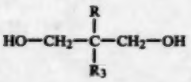
wherein

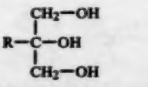
R, R^1, R^2 and R^3 are independently selected from alkyl radicals having from 1 to 22 carbon atoms, which comprises reacting a solution of an alkyl halide of the formula:

R^5X

wherein

R^5 can be R, R^1, R^2 or R^3 and X is chloride or bromine and a nonreactive water immiscible organic solvent with a mixture of a polyol of the formula





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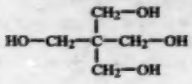


wherein

R and R_3 are as defined above and an alkaline aqueous medium in the presence of an effective amount of a phase transfer agent.

4,374,283

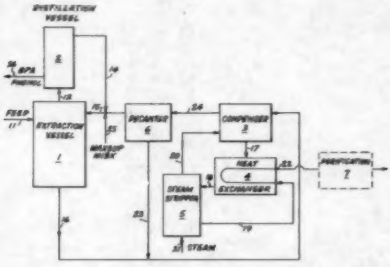
PURIFICATION OF AQUEOUS EFFLUENT STREAMS CONTAINING BPA AND PHENOL

Viney P. Aneja, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,421

Int. Cl.³ C07C 37/72

U.S. Cl. 568—724 **8 Claims**



1. A continuous process for purifying aqueous streams containing BPA and phenol comprising: introducing said aqueous effluent stream to an extraction vessel along with clean MIBK, removing from the top of said extraction vessel an MIBK solution of BPA and phenol, separating the BPA and phenol from the MIBK solution of BPA and phenol and recycling the MIBK to said extraction vessel, removing the heavy aqueous phase from said extraction vessel and passing said aqueous phase to MIBK removal means where MIBK is separated and returned to said extraction vessel, and recovering from said MIBK removal means an aqueous phase which is substantially free of BPA, phenol, and MIBK.

4,374,284

ANTIULCER, ANTIINFLAMMATORY, AND ANTIALLERGIC AGENT COMPRISING AS THE MAIN INGREDIENT OLEAN-12-ENE-3β, 30-DIOL WHICH IS DEVOID OF SIDE EFFECTS OF GLYCYRRHETINIC ACID AND A NEW PROCESS FOR PREPARATION OF OLEAN-12-ENE-3β, 30-DIOL

Shoji Shibata, Tokyo; Akira Kumagai, Chiba; Masatoshi Harada, Tokyo; Singo Yano, Chiba; Hiroshi Saito, Tokyo, and Kunio Takahashi, Urawa, all of Japan, assignors to Minophagen Pharmaceutical Company, Japan

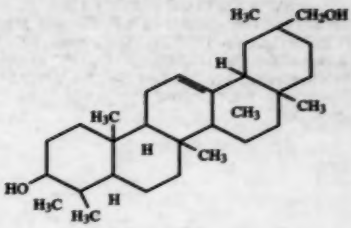
Filed Mar. 27, 1981, Ser. No. 248,222

Claims priority, application Japan, Apr. 1, 1980, 55-041196; Oct. 24, 1980, 55-148412

Int. Cl.³ C07C 35/22

U.S. Cl. 568—817 **17 Claims**

1. A pharmaceutical composition useful for the treatment of ulcer comprising as an active ingredient olean-12-ene-3β, 30-diol of the formula:



in an amount effective to display antiulcer activity in combination with a pharmaceutically acceptable carrier.

4,374,285

SYNTHESIS OF ETHANOL BY HOMOLOGATION OF METHANOL

Jiang-Jen Lin, and John F. Knifton, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 8, 1981, Ser. No. 223,514

Int. Cl.³ C07C 27/00

U.S. Cl. 568—902 **22 Claims**

1. A process for preparing ethanol which comprises contacting a mixture of carbon monoxide, hydrogen and methanol with a catalyst system comprising a ruthenium compound, a quaternary phosphonium or ammonium base or salt and a cobalt compound selected from the group consisting of cobalt(II) iodide, cobalt(II) bromide and cobalt(II) chloride at a pressure of 500 psi or greater and at a temperature of at least 150° C.

4,374,286

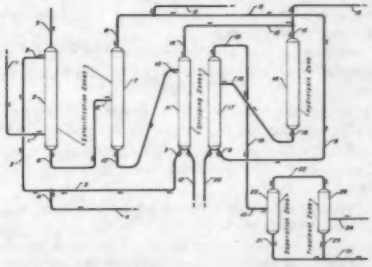
HYDRATION OF OLEFINS

Robert J. Schmidt, Rolling Meadows, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 26, 1982, Ser. No. 352,839

Int. Cl.³ C07C 29/10, 29/04, 27/02

U.S. Cl. 568—907 **19 Claims**



1. A process for the hydration of an olefinic hydrocarbon which comprises esterifying said olefinic hydrocarbon with an inorganic acid at esterification conditions in a first esterification zone, subjecting the resultant alkyl salts to trans-esterification by treatment with an organic acid at esterification conditions in a second esterification zone, stripping the resultant organic ester from the reconstituted inorganic acid, hydrolyzing said organic ester with water at hydration conditions in a hydration zone, stripping the resultant alcohol and ether hydrolysis product from the reconstituted organic acid, separating and recovering said alcohol from said ether at separation conditions in a separation zone, treating said ether at treatment conditions in a treatment zone to produce an additional amount of said alcohol, and recovering said alcohol.

4,374,287

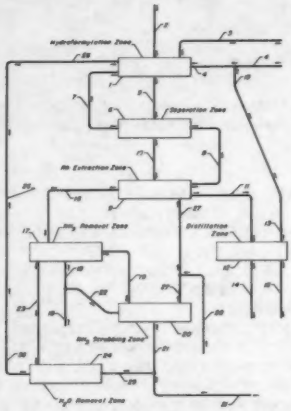
SYNTHESIS OF ALCOHOLS

Tamotsu Imai, Mt. Prospect, and Edwin H. Homeier, Maywood, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 163,762, Jun. 27, 1980, abandoned. This application Feb. 24, 1981, Ser. No. 237,561

Int. Cl.³ C07C 27/22

U.S. Cl. 568—909 **13 Claims**



1. A catalytic process for the synthesis of an alcohol from an olefinic hydrocarbon wherein a substantial quantity of catalyst is recovered which comprises:

(a) treating said olefinic hydrocarbon having at least 3 carbon atoms with carbon monoxide and hydrogen in a hydroformylation reaction zone at hydroformylation reaction conditions in the presence of a rhodium complex catalyst and a tertiary amine modifier to produce said alcohol in a homogeneous admixture with unreacted carbon monoxide, hydrogen, said rhodium catalyst and said tertiary amine modifier;

(b) separating said unreacted carbon monoxide and hydrogen in a first separation zone from said homogeneous alcohol product admixture;

(c) recycling at least a portion of said unreacted carbon monoxide and hydrogen to said hydroformylation reaction zone;

(d) treating said remaining homogeneous admixture comprising said alcohol, said rhodium catalyst and said tertiary amine modifier in a catalyst extraction zone with an aqueous ammonium hydroxide solution at treatment conditions to produce;

(i) an organic phase comprising said alcohol and said tertiary amine modifier, and

(ii) an aqueous ammonium hydroxide solution phase comprising said rhodium catalyst, water and ammonia;

(e) separating said organic phase in a second separation zone to produce an alcohol product stream and a tertiary amine modifier stream;

(f) recovering said alcohol product from said alcohol product stream;

(g) recovering said modifier from said modifier stream and recycling at least a portion of said modifier to said hydroformylation reaction zone;

(h) stripping ammonia from said aqueous ammonium hydroxide solution phase containing said rhodium complex catalyst by contact of said phase with an ammonia stripping agent consisting essentially of carbon monoxide at a temperature ranging from about ambient up to about 150° C. and a pressure ranging from about 0.1 to about 5 atmospheres to produce an aqueous stripping phase containing water, said rhodium complex catalyst and less than about 0.5 wt % ammonia;

(i) distilling off a portion of said water from said aqueous stripping phase at water distillation conditions to produce a stream consisting essentially of rhodium catalyst and water; and

(j) recycling at least a portion of said stream consisting essentially of rhodium catalyst and water to said hydroformylation reaction zone.

4,374,288

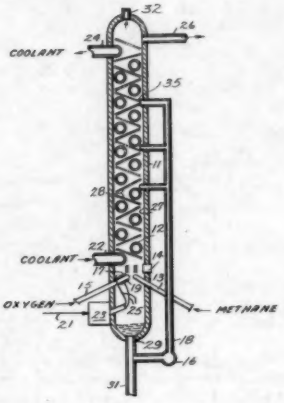
ELECTROMAGNETIC PROCESS AND APPARATUS FOR MAKING METHANOL

Robert L. Scragg, 4210 Prices Creek Rd., Huntington, W. Va. 25701

Filed Dec. 17, 1980, Ser. No. 217,501

Int. Cl.³ B01J 19/12; C07C 27/14, 29/48

U.S. Cl. 568—910 **11 Claims**



8. A method of forming methanol comprising the steps of:

continuously supplying methane gas at a low velocity to an enclosed reactor chamber;

generating an electromagnetic field within said reactor chamber, said electromagnetic field being sufficient to atomize oxygen but insufficient to cause arcing through said oxygen; and

continuously supplying oxygen at a low velocity to said chamber, said oxygen being atomized by said electromagnetic field, said atomized oxygen combining with said methane gas to form methanol.

4,374,289

PRODUCTION OF MONOFLUOROTRICHLOROETHANE

Michael Van Der Puy, and Ronald F. Piskorz, both of Cheektowaga, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 192,770, Oct., 1980, abandoned. This application Oct. 22, 1981, Ser. No. 313,535

Int. Cl.³ C07C 17/00

U.S. Cl. 570—168 **4 Claims**

1. A method for the production of 1-fluoro-1,1,2-trichloroethane which comprises reacting trichloroethylene with hydrogen fluoride using about 1.5 to 3.5 moles of hydrogen fluoride per mole of trichloroethylene, and conducting the reaction in the presence of tungsten hexafluoride at a temperature range of about 50° to 150° C. for a residence time of about one-fourth hour to five hours.

4,374,290

PROCESS FOR PREPARING VITAMIN K

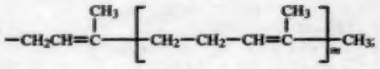
Karl H. Dötz, Vaterstetten, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 127,002, Mar. 4, 1980, Pat. No. 4,320,065. This application Nov. 9, 1981, Ser. No. 319,481
Int. Cl.³ C07C 9/00
U.S. Cl. 585—16 2 Claims

1. A compound of the formula:

$$CH_3—C{\equiv}C—R^3$$

wherein R^3 is geranyl, farnesyl, phytyl or



and m is an integer of from 3 to 13.

4,374,291

SYNTHESIS OF BIS(ETHYNYLPHENYL) COMPOUNDS

Kreisler S. Y. Lau, Alhambra, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 6, 1981, Ser. No. 318,716
Int. Cl.³ C07C 15/16
U.S. Cl. 585—320 11 Claims

6. A process for preparing 4,4'-diethynyldiphenylmethane in high yield comprising the steps of:

forming a slurry of 4,4'-diaminodiphenylmethane in concentrated sulfuric acid, adding $NaNO_2$ to said slurry and mixing said slurry with an aqueous solution of an inorganic halide to form a dihalogenated diphenylmethane;

coupling said dihalogenated diphenylmethane with ethynyltrimethylsilane by warming and stirring a mixture of said methane and said silane in the presence of an organopalladium catalytic complex, a ligand and deareated triethylamine and toluene to provide an end-protected diphenylmethane compound having acetylenic moieties as substituents; and

subsequently treating said end-protected compound with a weak base in an alcohol-ether solvent to remove said end-protecting groups, thereby yielding 4,4'-diethynyldiphenylmethane.

4,374,292

PROCESS FOR PREPARING α-THUJENE

Haruhiko Toda, Odawara; Moriaki Higo, Kanagawa; Hitoshi Saga, Hadano, and Masafu Shinbo, Odawara, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,430
Claims priority, application Japan, Feb. 3, 1981, 56-14762
Int. Cl.³ C07C 2/76
U.S. Cl. 585—360 2 Claims

1. A process for preparing α-thujene by isomerizing sabinene with an alkali metal and a primary or secondary amine, the improvement comprising using 0.2 to 0.5 moles of the alkali metal and 0.3 to 0.8 moles of the primary or secondary amine per mole of the sabinene.

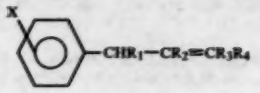
4,374,293

INDENE PRODUCTION FROM AROMATIC OLEFINS

J. D. Burrington, Richmond Heights; R. K. Grasselli, Chagrin Falls, and C. T. Kartisek, Sagamore Hills, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Aug. 14, 1981, Ser. No. 293,030
Int. Cl.³ C07C 12/64
U.S. Cl. 585—410 15 Claims

1. A process for making indene or substituted indene comprising contacting a reactant of the formula



wherein X is F, Br, I, Cl, H, C_{1-14} alkyl, or C_{6-14} aryl and/or OR_5 wherein R_5 is H or C_{1-4} alkyl, and wherein each of R_1, R_2, R_3 and R_4 are independently F, Cl, Br, I, OR_6, CO_2R_6, CHO, CN or NO_2 wherein R_6 is H, C_{1-14} alkyl or C_{6-14} aryl and molecular oxygen with a catalyst comprising an oxide of tungsten or an oxide complex of tungsten containing at least 30 atom % tungsten based on the metal atoms in said complex excluding oxygen.

4,374,294

ZEOLITE CATALYSTS MODIFIED WITH GROUP IIIA METAL

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 212,067, Dec. 2, 1980, Pat. No. 4,302,662. This application Sep. 17, 1981, Ser. No. 303,287
Claims priority, application France, Feb. 19, 1981, 81 300683
The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.
Int. Cl.³ C07C 2/68, 5/22, 5/52
U.S. Cl. 585—466 14 Claims

1. A process for conversion of organic compounds, said process comprising contacting said organic compounds with a crystalline zeolite catalyst composition at a temperature of between about 250° C. and about 750° C. and a pressure within the approximate range of $10^5 N/m^2$ to $10^7 N/m^2$, said catalyst comprising a zeolite characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, said catalyst further having incorporated thereon from about 1 to 45 percent by weight of a mixture of Rare Earth elements, said Rare Earth elements being present in said catalyst in the form of their oxides.

6. The process of claim 1, 3 or 5 wherein said conversion comprises the alkylation of an aromatic compound by contacting said compound with an alkylating agent to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

9. The process of claim 1, 3 or 5 wherein said conversion comprises the transalkylation of aromatic compounds to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

4,374,295

CATALYTIC CONVERSION OF METHANOL TO LIGHT OLEFINS

Carol S. Lee, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,496
Int. Cl.³ C07C 1/20, 1/253
U.S. Cl. 585—640 8 Claims

1. In a process for producing a hydrocarbon mixture containing light olefins by contacting a methanol feed with a catalyst comprising a crystalline aluminosilicate zeolite having a Constraint Index of about 1 to 12 and a silica to alumina molar ratio of at least about 12, said contacting occurring in a reaction zone under methanol conversion reaction conditions, the improvement which comprises:

co-feeding to said reaction zone along with said methanol feed an aldehyde-containing diluent comprising formaldehyde, acetaldehyde or a mixture thereof, in an amount sufficient to increase the selectivity of the conversion reaction for production of C_2 to C_4 olefins.

4,374,296

ISOMERIZATION OF PARAFFIN HYDROCARBONS USING ZEOLITES WITH HIGH STEAM-ENHANCED ACIDITY

Werner O. Haag, Lawrenceville, N.J., and Rudolph M. Lago, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 121,339, Feb. 14, 1980, Pat. No. 4,326,994. This application Mar. 31, 1981, Ser. No. 249,564

Int. Cl.³ C07C 5/13

U.S. Cl. 585—739 **23 Claims**

1. A process for effecting hydroisomerization of a C_4–C_8 paraffin which comprises contacting a feedstock containing the paraffin under hydroisomerization conditions with a catalyst comprising a porous crystalline zeolite characterized by silica/alumina mole ratio of greater than 12 and a constraint index within the approximate range of 1 to 12, which zeolite contains a minor proportion of a Group VIII metal and which zeolite has an enhanced acid activity achieved by a method comprising treating the zeolite with water under conditions of contact time, temperature and water partial pressure governed by the following relationship of treating time and water pressure at constant temperature:

$$0.01(Pt)_T<(Pt)<10(Pt)_T$$

where

$(Pt)_T=2.6\times10^{-9}e^{16000/T}$;

P=Water Partial Pressure, atmospheres;

t=Treating Time, hours;

T=Temperature, degrees K.

4,374,297

SELECTIVE OXIDATION OF ETHYL TOLUENE OR METHYL STYRENE ISOMER MIXTURES TO ENRICH META-ISOMER CONTENT

John M. Klosek, Sewaren, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 336,102

Int. Cl.³ C07C 7/00

U.S. Cl. 585—868 **12 Claims**

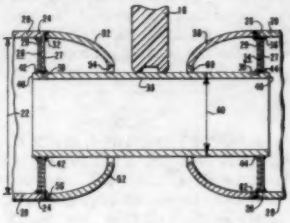
1. A process for preparing an isomer mixture of ethyl toluene or methyl styrene richer in the meta isomer than the starting mixture which comprises oxidizing a starting mixture of ethyl toluene isomers or methyl styrene isomers containing para isomer in which the meta isomer predominates in the presence of a zeolite having a Constraint Index of about 1 to 12, a silica to alumina ratio of at least about 12 which zeolite is modified with at least one transition element effective as an oxidation catalyst.

4,374,298

SEMI-FLEXIBLE GAS-INSULATED TRANSMISSION LINE USING SANDWICHED DISCS FOR INTERMITTENT FLEXING JOINTS

Prasad R. Kommineni, Westboro, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1982, Ser. No. 361,211
Int. Cl.³ H01B 9/06, 9/04; H02G 5/06
U.S. Cl. 174—21 C **4 Claims**



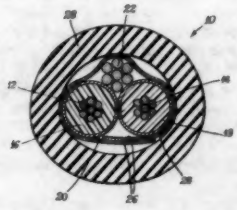
1. A gas-insulated transmission line comprising:
an elongated outer sheath;
an elongated inner conductor disposed within said outer sheath, said inner conductor comprising a pair of longitudinally spaced-apart cylindrical main conductor sections having a first diameter and facing ends, a flexing element fixedly secured to each main conductor section end and extending radially inwardly therefrom and a cylindrical conductor hub section having a second diameter less than said first diameter fixedly secured to both flexing elements adjacent the ends of said conductor hub section, each of said flexing elements comprising a pair of thin, hollow discs sandwiched together by fusing on the inside and outside diameters thereof, said conductor hub section extending through said hollow sandwiched discs;
an insulating gas electrically insulating said inner conductor from said outer sheath; and
means for insulatably supporting said inner conductor in said outer sheath.

4,374,299

TRIBOELECTRIC TRANSDUCER CABLE

John Kincaid, Batavia, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed May 19, 1980, Ser. No. 150,795
Int. Cl.³ H01B 11/06
U.S. Cl. 174—36 **9 Claims**



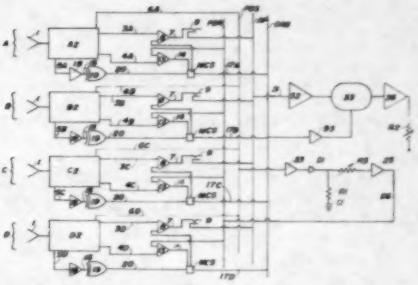
1. A triboelectric transducer cable for generating a signal in response to movement or deformation thereof, comprising
a pair of insulated central conductors,
a semi-conductive element independently wrapped in physically separate and surrounding relation to each of the insulated central conductors,
an additional drain wire conductor arranged in electrically conductive contact with the semi-conductive element, said semi-conductive element being unbonded to the insulated central conductors, a conductive shield means surrounding the drain wire conductor and the semi-conductive lazer element and being in electrical contact therewith, and
a protective jacket surrounding the insulated central conductors, semi-conductive element, drain wire conductor and shield means of the cable.

4,374,300

SOUND MIXER DEVICES

Robert Posto, and Hardison G. Martin, both of Louisville, Ky., assignors to Innovative Electronics, Inc., Louisville, Ky.

Filed Oct. 18, 1979, Ser. No. 85,905
Int. Cl.³ H04M 1/60
U.S. Cl. 179—1 AT **10 Claims**



1. A multiple input signal transmission means including:
(a) at least two signal input channels, each channel including:
(i) program input signal generating means to generate an alternating current first program output signal in response to receipt of an input signal;
(ii) rectifier means to receive said alternating current first program signal and provide a direct current first program signal;
(iii) comparator means to receive said direct current first program signal and a direct current reference signal and to generate first and second actuator signals in response to selected differences between said direct current first program signal and said reference signal;
(iv) input channel master control switch means to receive said first and second actuator signals and to generate a first master control output signal in response to receipt of said first actuator signal and to generate a second master control output signal in response to receipt of said second actuator signal and transmit one of said first and second master control output signals upon receipt of a master control switch initiator signal;
(v) program switch means to receive said first program output signal and said first and second master control output signals to provide a first program output signal upon receipt of said first master control output signal and to provide a second program output signal upon receipt of said second master control output signal;
(vi) "0" crossing detector means to receive said first alternating current program output signal and to generate said master control switch initiator signal upon occurrence of "0" voltage in said first program signal and to couple said master control switch initiator signal to said master control switch to permit transmission of one of said first and second master control switch signals;
(b) collector buss means to receive said direct current first program signal from selected input channels and generate said reference signal and supply said reference signal to said comparator means of each input channel;
(c) attenuator means to receive said second program output signals and said master control output signals from at least

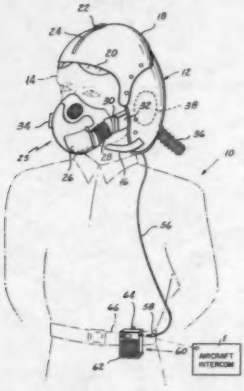
two of said master control switch means and, attenuate said second program signals as a function of said control output signals and transmit combined and attenuated second program output signals to output means.

4,374,301

LOCAL EXTERNAL COMMUNICATION DEVICE FOR ENCLOSED HELMET AND MASK ASSEMBLY

Leonard P. Frieder, Jr., Dalton, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed Sep. 18, 1980, Ser. No. 188,510
Int. Cl.³ H04M *1/02*
U.S. Cl. 179—1 R **9 Claims**



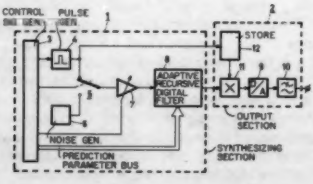
6. A local external communication device for use with an assembly which covers the ears of the wearer and which is provided with a communication system comprising an earphone and a lead provided with a first coupling element for connecting said communication system to a radio or intercom system including in combination, a housing, a microphone in said housing, a battery in said housing, a second coupling element on said housing adapted to mate with said first coupling and means including said coupling elements when engaged connecting said device microphone to said earphone and connecting said battery only to said device microphone.

4,374,302

ARRANGEMENT AND METHOD FOR GENERATING A SPEECH SIGNAL

Leonardus L. M. Vogten, and Leonardus F. Willems, both of Eindhoven, Netherlands, assignors to N.V. Philips' Gloeilampenfabrieken and Technische Hogeschool Eindhoven, both of Eindhoven, Netherlands

Filed Dec. 12, 1980, Ser. No. 216,000
Claims priority, application Netherlands, Jan. 21, 1980, 8000361
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SM **6 Claims**



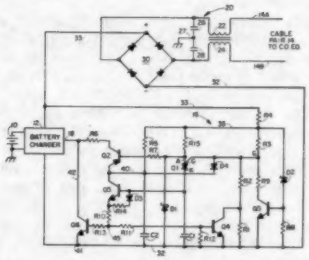
1. An arrangement for generating a speech signal comprising a synthesizing section based on the linear prediction principle of producing a discrete signal consisting of a plurality of consecutive sub-signals, each representing a voiced or unvoiced speech segment, and an output section for converting the discrete signal into the speech signal, characterized in that the output section comprises means for modulating the sub-signals of the discrete signal corresponding to voiced speech segments with a window signal, the duration of which corresponds to the duration of a sub-signal and the amplitude of which increases first gradually from substantially zero value to a constant value decreases thereafter gradually to substantially zero value, so that at the instant of transistion from one sub-signal to a next sub-signal the amplitude of the speech signal is substantially zero.

4,374,303

POWER SUPPLY CONTROL CIRCUIT FOR SUBSCRIBER CARRIER TELEPHONE SYSTEM

James A. Stewart, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Mar. 27, 1981, Ser. No. 248,128
Int. Cl.³ H04M *1/00*; H02J *7/02*
U.S. Cl. 179—2 BC **10 Claims**



1. Apparatus responsive to prescribed voltage conditions, such as a high voltage that is greater than a first threshold level and a low voltage that is less than a second threshold level, on the pair of wires of a cable pair for rendering a carrier subscriber local battery charging circuit inoperative for at least a prescribed time interval, operation of the charging circuit connecting it through the cable pair to a central office power source from which it draws current for charging the local battery, said apparatus comprising:

first and second lines adapted for electrical connection to one and other of the cable pair wires;

a storage capacitor having one and other terminals electrically connected to said first and second lines, respectively, said storage capacitor being charged with line current on the cable pair that is drawn from the central office power source;

a timing capacitor having a first terminal electrically connected to said first line and having an other terminal;

programmable unijunction transistor (PUT) means having cathode, gate and anode electrodes, said cathode being electrically connected to the other terminal of said timing capacitor;

first means electrically connecting the other terminal of said storage capacitor to said PUT means anode;

second means responsive to both high voltage and low voltage conditions on the cable pair that exceed and fall below the first and second threshold levels for producing a voltage change on said PUT means gate that makes it sufficiently negative with respect to the voltage on said PUT means anode to cause said PUT means to conduct and discharge said storage capacitor into said timing capacitor;

third means responsive to a charge voltage on said timing

capacitor for holding the charging circuit inoperative for at least the prescribed time interval during discharge of said timing capacitor following conduction of said PUT means; and

fourth means responsive to the charge voltage on said timing capacitor for lowering the PUT means gate voltage on conduction of said PUT means and raising the PUT means gate voltage immediately prior to said third means enabling the charging circuit to operate to draw line current on the cable pair for charging the local battery so as to inhibit on-off cycling of the charging circuit.

4,374,304

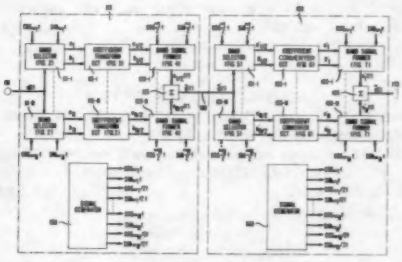
SPECTRUM DIVISION/MULTIPLICATION COMMUNICATION ARRANGEMENT FOR SPEECH SIGNALS

James L. Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 26, 1980, Ser. No. 190,993

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—15.55 R **15 Claims**



1. A speech communication system comprising a transmitter including means for receiving an input speech signal; means for partitioning the input speech signal into a plurality of subband portions; means responsive to each partitioned subband portion of the input speech signal for generating a signal representative of said subband portion; and means for applying said subband portion representative signals to a communication channel;

characterized in that

said subband portion signal generating means comprises means responsive to the subband portion of the input speech signal for producing a signal of bandwidth W/k representative of the short-term spectrum of said subband portion where W is the bandwidth of said subband portion and k is an integer, said W/k bandwidth subband portion representative signal producing means comprises means for dividing the instantaneous phase component of said speech signal subband portion by a signal corresponding to the integer k wherein the amplitude component of said speech signal subband portion is unaltered; and said subband portion signal applying means comprises means for summing the W/k bandwidth subband portion representative signals to form a signal of bandwidth W_T/k representative of the short-term spectrum of said speech signal where W_T is the bandwidth of said speech signal.

4,374,305

ARRANGEMENT FOR REGENERATING START-STOP SIGNALS AND DIAL PULSES

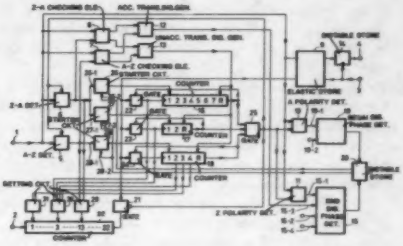
Robert Bodart, and Jean-Pierre Werts, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 38,759, May 14, 1979, abandoned, which is a continuation of Ser. No. 834,241, Sep. 19, 1977, abandoned. This application Sep. 26, 1980, Ser. No. 191,098

Claims priority, application Netherlands, Nov. 8, 1976, 7612357

Int. Cl.³ H04L *25/52, 25/64;* H04Q *1/36*

U.S. Cl. 179—16 EA **4 Claims**



1. A method for regenerating start-stop signals and dial pulses and converting the regenerated signals into an isochronous signal, said method comprising regenerating the start-stop signals by means of a regeneration process with n sampling instants initiated by a stop-start transition, regenerating the dial pulses by a combined regeneration process comprising two mutually exclusive regeneration processes which are initiable by signal transitions in opposite directions, storing the signal samples taken at the sampling instants in an elastic storage device, and reading said storage device at isochronous timing instants for forming an isochronous information signal, characterized in that the combined regeneration process comprises regenerating said dial pulses in reduced form with two sampling instants initiated by a stop-start transition, and inversely regenerating said dial pulses with four sampling instants initiated by a start-stop transition.

4,374,306

ZERO-LOSS AUTOMATIC POLARIZATION PROTECTION DEVICE

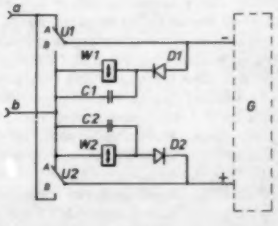
Joachim Lohr, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Gerlin, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,044

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2947283

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **3 Claims**



1. A zero-loss, automatic polarity safeguard device for telecommunication apparatus, said device comprising:

first and second supply rails having respective input and output terminals, said output terminals being adapted to be

connected to said telecommunication apparatus, each said supply rail having a predesignated polarity;

first and second exchange lines;

first changeover contact for selectively connecting the input terminal of said first supply rail to one of said exchange lines;

a second changeover contact for selectively connecting the input terminal of said second supply rail to one of said exchange lines;

bistable polarised electromagnetic relay means coupled to said first and second contacts for simultaneously actuating said first and second contacts to selectively connect said first exchange line to one of said input terminals and said second exchange line to the other of said input terminals, there being no voltage dropping element between said exchange lines and said output terminals of said supply rails; and

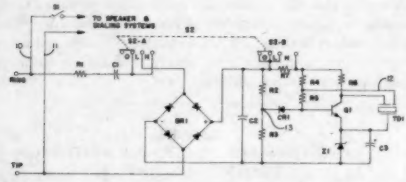
diode means connected between each of said first and second supply rails and said relay means so as to detect the relative polarity of said supply rails pursuant to an input signal on said exchange lines and to selectively actuate said relay means to match the polarity on said exchange lines to the respective predesignated polarity of said supply rails, actuation of said relay means occurring only when the polarity of the signal on said exchange lines does not match the predesignated polarity of said supply rails to which said exchange lines are respectively connected.

4,374,307

RINGER SYSTEM FOR A TELEPHONE

Peter H. Hangen, Arlington, and Christopher R. Kline, Fort Worth, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Filed Aug. 29, 1980, Ser. No. 182,695
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—84 T **3 Claims**



1. A telephone ringer system for producing an audible sound in response to an incoming ring signal, said ringer system comprising:

detector means for detecting the receipt of an incoming ring signal to the ringer system and for producing an output signal related thereto, said detector means having a rectifying means for converting the alternating current of the ring signal to direct current, a voltage divider circuit and a capacitor, all connected in parallel; and

oscillator circuit means having a piezoelectric transducer for producing an audible ring signal and driving means connected to said detector means and to the piezoelectric transducer, said driving means having a transistor with base, collector, and emitter electrodes, means for connecting the piezoelectric transducer between the collector and emitter electrodes, means for operatively connecting the base electrode to the detector means, and a combination of a zener diode and a second capacitor connected in parallel for connecting the emitter electrode of the transistor to the most negative terminal of the rectifying means, so that said oscillator circuit means oscillates and causes the piezoelectric transducer to produce an audible ring signal in response to the output signal from the detector means having at least a predetermined voltage.

4,374,308

I-USE INDICATION IN A TELEPHONE KEYSET

John Holesha, West Palm Beach, Fla., assignor to Siemens Corporation, Iselin, N.J.

Filed Apr. 30, 1981, Ser. No. 258,882
Int. Cl.³ H04M *1/22*
U.S. Cl. 179—99 LS **13 Claims**

1. Telephone keyset apparatus comprising in combination:

(a) a plurality of dialing keys for dialing a telephone number;

(b) a plurality of line keys, each associated with a single telephone line, for selecting the associated telephone line;

(c) a plurality of first indicator lamps, each associated with one of said line keys, for indicating, when illuminated, that its associated telephone line is in use;

(d) at least one function key for selecting a function to be performed by the telephone keyset apparatus; and

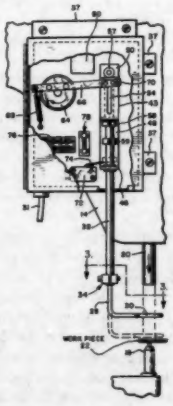
(e) means responsive to the operation of said one function key for turning off all of said first indictor lamps with the exception of that one first indicator lamp associated with that telephone line to which the telephone keyset apparatus is currently connected.

4,374,309

MACHINE CONTROL DEVICE

Russell C. Walton, 106 Center Ave., Libertyville, Ill. 60048

Continuation-in-part of Ser. No. 44,651, Jun. 1, 1979, Pat. No. 4,365,122. This application Jul. 28, 1980, Ser. No. 171,881
Int. Cl.³ H01H *3/16*; F16D *9/00*
U.S. Cl. 200—61.42 **11 Claims**



1. A machine control system for controlling the movement of a machine tool along a path comprising:

a movable support rod;

a sensor coupled to said movable support rod;

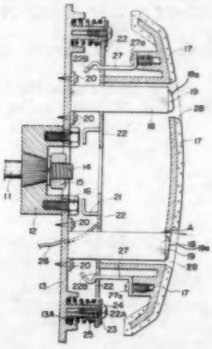
mounting means coupled to slidably retain said support rod for movement along an axis;

a limit switch coupled to said mounting means to be closed upon movement of said sensor to a preselected position;
means coupled to said support rod for closing said limit switch during movement of the rod along said axis;
means extending from said support rod;
a movable arm having one end positioned in contact with and beneath said extending means so that said extending means rests thereon;
means coupled to said mounting means and to said arm for moving said arm to allow said rod and sensor to move along said axis;
actuator switch means electrically coupled to said moving means for selectively providing power to said moving means as an incident of actuation of said actuator switch means;
relay means responsive to said actuator switch means and to closure of said limit switch for providing power to cause movement of a machine tool;
a disconnect switch means coupled to said relay means and responsive to the end of a machine stroke for terminating said power causing machine tool movement; and
control circuitry means for causing said relay means to maintain power to cause movement of the machine tool as long as said actuator switch means remains actuated regardless of the condition of said limit switch whereby continued movement of the machine tool may be effected notwithstanding movement of the sensor from said preselected position subsequent to movement thereto.

4,374,310
SWITCH ARRANGEMENT ON MOTOR VEHICLE STEERING WHEELS

Shinichi Kato, Fujisawa; Hiroshi Tsuda; Kiyoshi Yamaki, both of Yokohama; Tadashi Suzuki, Yokosuka, and Fumiyoshi Kuwano, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 23, 1981, Ser. No. 246,616
Claims priority, application Japan, Mar. 25, 1980, 55-37764
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—61.54 **9 Claims**

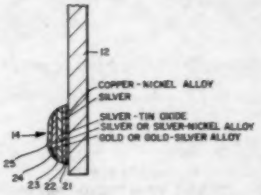


1. A steering wheel device for an automotive vehicle, comprising:
a steering shaft;
a steering wheel frame fixed to the upper end portion of the steering shaft;
a main frame being movable in relation to the steering wheel frame;
a steering wheel pad attached to the main frame, said pad operatively connected to a horn switch means for enabling the pad to actuate a vehicle horn when the front pad surface is depressed, said steering wheel pad having at least one operation hole; and
at least one operation switch for controlling an electric device other than the vehicle horn, said operation switch being attached to the steering wheel frame and located within the operation hole, wherein an outwardly facing surface of the operation switch is located in the operation hole in spaced relationship from the front surface of the steering wheel pad by a depth sufficient to prevent the switch from protruding above the steering wheel pad front surface when the steering wheel pad is pushed to actuate the horn switch.

4,374,311
ELECTRICAL MULTILAYER CONTACT

Keiji Okahashi; Masanori Motoyama, both of Hirakata, and Satoru Furukawa, Kadoma, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 13, 1981, Ser. No. 282,711
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027304
Int. Cl.³ H01H *1/02*
U.S. Cl. 200—269 **10 Claims**



1. An electrical multilayer contact, comprising the following layers disposed upon each other on a contact support member:
a first layer of a copper-nickel alloy forming a mechanical and electrical connection to said support member,
a second layer having a very high silver content of up to 100%,
a third layer of a silver-tin oxide composition,
a fourth layer of a silver alloy containing up to a 100% silver, and
a fifth layer of a gold alloy containing up to 100% gold.

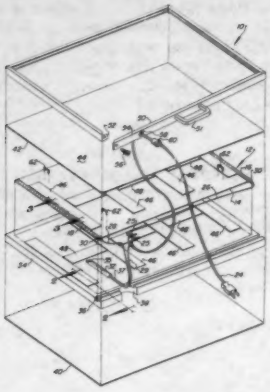
4,374,312
PANEL TYPE HEATING APPARATUS

John W. Damron, P.O. Box 402603, Dallas, Tex. 75240

Filed Mar. 16, 1981, Ser. No. 243,865
Int. Cl.³ F24H *9/02*
U.S. Cl. 219—345 **10 Claims**

1. A panel type heating apparatus comprising:
a sheet of electrically conductive paper having a resistance to current flow and operable to generate heat when connected to a source of electric energy;
spaced apart primary conductor element means fixed to said sheet and to respective electrical conductor leads;
a first substantially rigid relatively thick walled member disposed on one side of said sheet, said member being of electrical and heat insulative material and forming a supporting surface for said sheet;
a second relatively thin walled member disposed on the opposite side of said sheet, said second member being of an electrically insulative but heat conductive material;
means for securing said sheet to at least one of said members, said securing means comprising at least one elongated strip of electrically non-conductive tape having an adhesive layer on opposite sides for securing said tape to said sheet and said one member whereby said sheet is secured against movement with respect to said one member; and
means for securing said first and second members in assembled relationship with said sheet wherein said sheet is

disposed between said members and is adapted to generate heat to be conducted by and radiated from said second



member when electrical current is passed through said sheet.

4,374,313

ARRANGEMENT FOR WORKING INTERNAL ROTATIONAL SURFACES OF METAL PARTS IN A CYLINDRICAL OPENING HAVING A HIGH SLENDERNESS RATIO

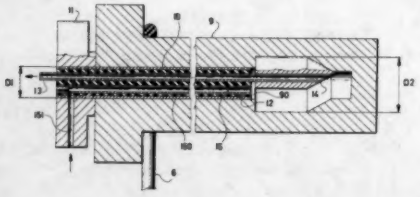
Ludvik Mateja, Velke Mezirici, and Zdenek Chaloupka, Merin, both of Czechoslovakia, assignors to Motorpal Jihlava, narodni podnik, Jihlava, Czechoslovakia

Filed Dec. 4, 1980, Ser. No. 213,168

Claims priority, application Czechoslovakia, Dec. 5, 1979, 8428-79

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 E **4 Claims**



1. An arrangement for working internal rotational surfaces of a metal part having a cylindrical opening or in a cylindrical through-going opening having a high slenderness ratio, comprising a working electrode connected to the negative pole of a source of burning electrical impulses, the positive pole of which is conductively connected with the metal part, and cylindrical guiding sleeve having a bore therethrough, a supporting tube and an electrode, the electrode being fixed conductively on the supporting tube, said tube being arranged rotatably and eccentrically in the cylindrical guiding sleeve from which it is insulated, the external diameter of the sleeve corresponding to the internal diameter of the cylindrical opening of the metal part, the cross-section of the electrode when the electrode is in its position for insertion in the opening of the metal part at the maximum corresponding to the diameter of the bore through the cylindrical guiding sleeve.

4,374,314

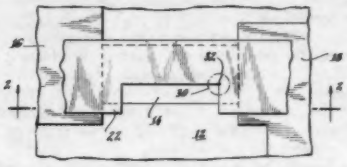
LASER TEMPLATE TRIMMING OF CIRCUIT ELEMENTS

James J. Deacutis, Somerville, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Aug. 17, 1981, Ser. No. 293,678

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LJ **5 Claims**



1. The method of laser trimming a thin film circuit element supported on a substrate and coated with a generally non-conductive, optically transparent overlayer comprising:

depositing on said overlayer an optically opaque coating having an edge aligned with a desired trim boundary of said circuit element;

providing a laser having an output beam with a non-uniform cross-sectional energy distribution wherein the maximum energy is concentrated near the center, and a wavelength substantially absorbed by said circuit element and blocked by said opaque coating;

directing said laser beam at the edge of said opaque coating with its peak energy approximately adjacent said edge, to penetrate and volatilize a portion of said circuit element with the maximum energy region of said beam; and

relatively moving said beam along said edge to thereby trim a selected region from said circuit element while substantially avoiding contact of low energy portions of said beam with the remaining portion of said circuit element.

4,374,315

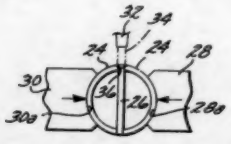
GOLF CLUB SHAFT AND METHOD OF MAKING THE SAME

Robert L. Timbrook, 883 Linda Flora Dr., Los Angeles, Calif. 90049

Division of Ser. No. 117,964, Feb. 4, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 297,029

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LD **2 Claims**



1. A method of forming a golf club shaft that may be adjusted to provide a desired stiffness thereto depending on the configuration it occupies relative to a golf club head to which it is secured, said method comprising the steps of:

a. transforming first and second strips of a resilient laser weldable metal into longitudinally tapering first and second sections of semi-circular transverse cross section, each of said sections having a pair of laterally spaced, longitudinally extending free edges;

b. providing an elongate tapered web of a resilient laser weldable metal;

c. disposing said pairs of free longitudinal edges of said first and second sections in pressure contact with opposite longitudinal side edge portions of said web;

d. laser welding said free edge portions of said first and second sections to opposite side edges of said web to provide first and second diametrically opposed, longitudinally extending beads in which portions of said sections and web of said laser weldable metal merge to secure said web to said sections without altering the physical characteristics of said sections; and

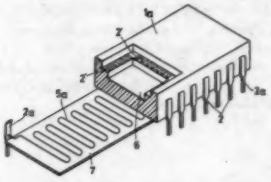
e. trimming portions of said beads from said shaft that project outwardly from the exterior surface on the latter, with said shaft having maximum stiffness when said shaft is so secured to a golf club head that said web is normal to the striking face of said golf club head.

4,374,316

SEMICONDUCTOR INTEGRATED CIRCUIT SUPPORTER HAVING A HEATING ELEMENT

Kazuo Inamori, Kyoto, and Kiyoshige Miyawaki, Kagoshima, both of Japan, assignors to Kyoto Ceramic Co., Ltd., Japan

Filed Aug. 22, 1980, Ser. No. 181,379
Claims priority, application Japan, Aug. 29, 1979, 54-110904
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—209 **10 Claims**



1. A semiconductor integrated circuit supporter comprising:

a body comprising a thermally conductive, electrically non-conductive material, said body being configured to support an integrated circuit on a first flat surface thereof;

a cavity disposed within said body and said first flat surface configured to support an integrated circuit is located within said cavity;

a flat heating element disposed on a second flat surface of said body, said second flat surface being in an overlapping spaced-apart relationship with said first surface; and

means for joining said flat heating element to a source of energy such that said flat heating element, when activated, conducts heat to said first surface of said body.

4,374,317

BURN-IN CHAMBER

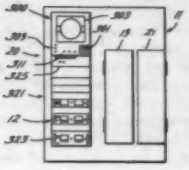
James I. Bradshaw, Houston, Tex., assignor to Reliability, Inc., Houston, Tex.

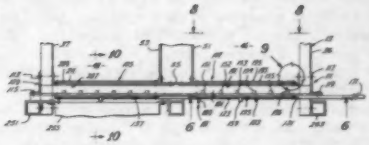
Filed Jul. 5, 1979, Ser. No. 55,058
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—385 **11 Claims**

1. An improved apparatus for stressing semiconductors disposed on a component unit having a component retaining portion and a coupling portion, said apparatus being of the type including (i) a chamber having an air space and a wall surrounding said air space, (ii) environment controlling means for maintaining said air space at a temperature substantially greater than that outside said chamber, and (ii) connection means for providing an electrical connection between the inside of said chamber and the outside of such chamber, said connection means including a connector having coupling means for releasably coupling with said coupling portion of said component unit while said component retaining portion of said component unit is disposed within said air space of such chamber, wherein the improvement comprises:

isolation means for isolating said connector from said air space such that contact between the air of said air space and the connector is substantially reduced and the flow of air between the inside and outside of said chamber adjacent said connector is substantially inhibited,

said isolation means including (i) a cavity extending from the inner surface of said wall of such chamber through at least a portion of said wall of said chamber, (ii) a cavity base disposed between the inner surface of said wall and the exterior of said chamber and (iii) a cavity cover disposed





between said cavity base and said air space of said chamber,

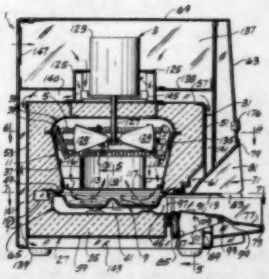
said coupling means of said connector being disposed between said cavity cover and the exterior of said chamber and being spaced away from said cavity cover and means for supplying a cooling medium between said cavity cover and said cavity base.

4,374,318

APPARATUS FOR HEATING FOOD, SUCH AS FRENCH FRIED POTATOES

John W. Gilliom, Wooster, Ak., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 8, 1980, Ser. No. 185,210
Int. Cl.³ H05B *1/00*; F24C *7/00, 15/32*
U.S. Cl. 219—400 **34 Claims**



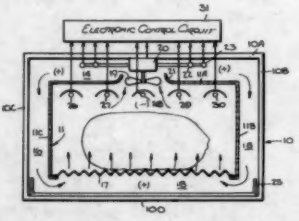
1. A convection oven having a bottom, top and wall structure defining a chamber, the chamber having a lower section forming a compartment at the bottom of the chamber, a pan for holding an item or items and in particular food items to be heated such as french fried potatoes, the oven wall having an access opening to said compartment from one side of the oven constituting its front for insertion and removal of the pan, the chamber further having an upper section above the lower section constituting an air delivery and return section, the oven

wall completely surrounding said upper section, a partition extending generally vertically in said upper section having its upper end spaced from the top of said chamber and its lower end adjacent the top of said compartment, said partition dividing said upper section into a first passage for downward flow of heated air into the pan in said compartment and a second passage for upward return flow of air from said compartment, means at the top of said upper section of the chamber for blowing air down through the first passage, into the pan in said compartment, over and around an item or items in the pan, and thence up and out of the pan and up through said second passage back to said blowing means, means in said upper section for heating the air, said compartment and pan being so formed relative to one another and the pan being so formed relative to the lower end of said air delivery and return section that the compartment receives the pan, as inserted into the compartment through said access opening, with the pan supported at its bottom in said compartment and with the top of the pan generally at the level of the lower end of said air delivery and return section, with the pan, at its top, positioned in part directly under the lower end of the first passage for downward flow from the first passage into the pan and in part directly under the lower end of the second passage for flow of air up and out of the pan into the second passage, and means for interengagement of the pan generally all around the pan with respect to the lower end of said air delivery and return section and in surrounding relationship with respect to the lower end of both of said passages so that the pan cooperates with said air delivery and return section and itself forms an intermediate generally closed passage through which the heated air is confined to flow from the first to the second passage, whereby substantially all of the air exiting from the lower end of the first passage flows through the pan over and around the item or items in the pan and thence up through the second passage and back to the blowing means.

4,374,319
COUNTER-TOP OVEN

Raul Guibert, Los Angeles, Calif., assignor to Sunset Ltd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 97,787, Nov. 27, 1979, Pat. No. 4,307,286. This application Dec. 30, 1980, Ser. No. 221,206
Int. Cl.³ A21B 1/22; F27D 11/02
U.S. Cl. 219—400 **10 Claims**



1. A counter-top oven adapted to effect low-temperature cooking of food having a predetermined cooking temperature at a relatively rapid rate whereby nutrients and other valuable food constituents are preserved, said oven comprising:

A. A food-receiving compartment having a perforated bottom wall and a top wall provided with a port, said compartment being supported within a case and being spaced therefrom to create air spaces therebetween;

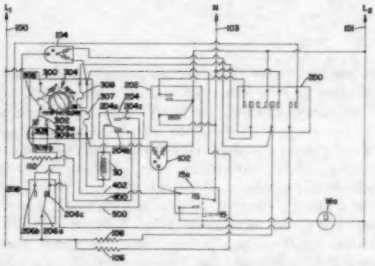
B. means external to said compartment to heat air to a high temperature level well above said cooking temperature and to force the hot air through the perforations in said bottom wall at high pressure to produce a high velocity flow of hot air through the compartment in heat exchange relation with the food therein, the hot air being discharged from the compartment through the port, said means being constituted by a motor-driven fan in one of said air spaces arranged to draw air from said compartment through said top wall port to produce a negative pressure in said compartment and a positive pressure in the air spaces, the resultant pressure differential forcing air through said perforations; and

C. means periodically to interrupt the flow of hot air to generate within the compartment hot air pulses having no-flow intervals therebetween in a manner creating a laminar heat transfer pattern wherein heat acquired by the outer layer of the body of food in the compartment is transferred in these intervals to the intermediate layers and core of the body, causing the outer layer to go down in temperature during these intervals to a degree preventing the temperature of the outer layer from ever rising substantially above the cooking temperature despite the much higher temperature of the hot air pulses in heat exchange relation therewith.

4,374,320
MOTORIZED OVEN DOOR LATCH AND CONTROL CIRCUIT FOR SAME

Eugene J. Barnett, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 18, 1981, Ser. No. 264,470
Int. Cl.³ A21B 1/00; F27D 11/02
U.S. Cl. 219—413 **14 Claims**



1. In a domestic range having a body including an outwardly opening, pyrolytic self-cleaning oven chamber, electrical heating means supplying heating energy into the oven chamber and a hinge-mounted oven door supported by the body and movable from an open to a closed position to preclude access to the oven chamber, a motorized oven door latch mechanism for locking the oven door in a closed position, comprising:

a motor means supported by the range body, the motor means having a rotatable drive shaft;

an elongated latch rod having at one end a hook portion extending generally radially away from the longitudinal axis of the rod, the other end of the rod being rotatably driven by the drive shaft, the latch rod being restrained against free translational movement along its axis relative to the range body at at least one point;

an elongated member having its end portions fixed to the oven door;

a cam surface fixed to the center portion of the elongated member, the cam surface being radially spaced from the longitudinal axis of the elongated member, wherein with the oven door closed, the latch rod hook portion can be rotated by the motor means to engage the hook portion with the cam surface to exert a pulling force on the cam surface and place said elongated member in torsion to bias and maintain the over door in tight sealing engagement with the range body.

4,374,321

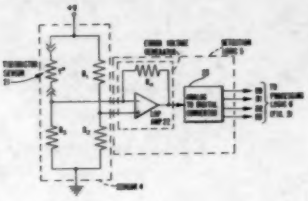
AUTOMATIC TEMPERATURE CONTROLLER FOR AN ELECTROPHOTOGRAPHIC APPARATUS FUSER AND METHOD THEREFOR

Joseph E. Cunningham, Jr., and Philip T. Gianos, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 102,508, Dec. 11, 1979, abandoned. This application Sep. 10, 1981, Ser. No. 300,729

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **6 Claims**



1. In a copier system, including a heated device, a device heater and a device temperature sensor, the invention comprising:

a digital converter, connected to the temperature sensor, operable to supply a digital value, from a set of temperature values, representing the temperature of the heated device sensed by the sensor;

an alternating current source operable in accordance with a control signal supplied at an input, to selectively provide successively positive and negative half-cycles of alternating current;

a counter, connected to the alternating current source, operable, as each alternating current cycle becomes zero, to count as digital values, successively provided half-cycles within a set of half-cycles;

a memory, connected to the converter and counter, storing as electrical states, signals representing points in an array defined by the set of temperature values in one dimension and the set of counts of half-cycles in another dimension, each point having a predefined one of a plurality of values;

accessing circuits, connected to the memory, the counter and the source, operable to sequentially access points in the array defined by a temperature digital value and, the counts of half-cycles, and supply to the source input a control signal for each accessed array point having a specified value;

whereby the heated device receives from the source a predetermined number of the half-cycles of said set of half-cycles.

4,374,322

APPARATUS FOR CONTROLLING THE ABSORPTION OF ONE OR MORE COLOR COMPONENTS IN A DYEING FLUID

Erich Hoffmann, Freigericht, and Werner Ptaschek, Bruchköbel, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,441

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917075

Int. Cl.³ G01J *3/34*

U.S. Cl. 250—226 **14 Claims**

1. A system for controlling the dye exhaustion of at least one color component contained in a dye liquor in a dyer's bath for dyeing of textile materials or the like comprising

means (1.1) regulating the temperature of the dye liquor or bath in a vat (1) as a function of change in extinction;

photometric means (4) sensing absorption of at least one color component;

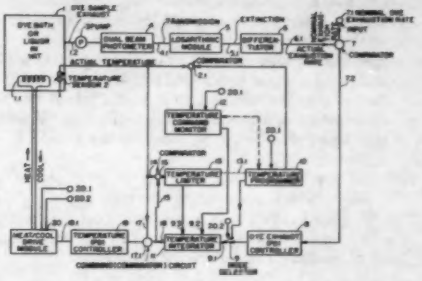
means (5) providing a signal (E) representative of the extinction;

means (6) processing the extinction signal (E) for generating a signal representative of the actual exhaustion rate;

means (7.1) for providing a nominal exhaustion rate signal;

comparator means (7) connected to and controlled by the nominal exhaustion rate signal providing means and the actual exhaustion rate generating means, and generating a dye exhaustion rate setting signal (7.2) as a function of deviation of the actual, from the commanded dye exhaustion rate;

means (8) for controlling dye exhaustion rate connected to and receiving the dye exhaustion rate setting signal, connectable (9) with means (11) generating a signal representative of a



temperature to effect dye exhaustion at a predetermined rate and providing a nominal temperature control signal (18) representative of the desired temperature at which dyeing should be performed;

temperature sensing means (2) generating an actual temperature signal (17);

signal combining means (17.1) receiving the actual temperature signal and the nominal temperature signal, and generating a corrected temperature control signal as a function of deviation of the actual from the nominal temperature;

and dye liquor temperature control means (19) controlling the temperature of the dye liquor or bath in the vat (1) under control of said temperature control signal.

4,374,323

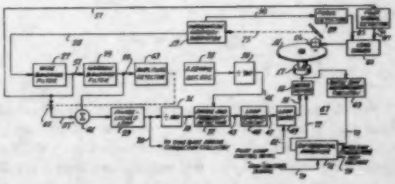
FOCUSING APPARATUS FOR USE IN A SYSTEM FOR RECOVERING INFORMATION FROM AN OPTICALLY-READABLE STORAGE MEDIUM

John S. Winslow, Altadena, and Wayne R. Dakin, Redondo Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 920,701, Jun. 30, 1978, Pat. No. 4,236,050. This application Aug. 11, 1980, Ser. No. 177,148

Int. Cl.³ G11B *11/00*

U.S. Cl. 250—201 **2 Claims**



1. In combination:

a movable information storage medium having a plurality of substantially parallel information tracks formed therein:

means for scanning said storage medium with a beam of radiation to recover information recorded thereon;

means for focusing the beam of radiation on a selected one of

said plurality of information tracks to recover information recorded thereon, the information recorded on each of said plurality of information tracks including a pilot signal having a phase angle aligned with the phase angle of the pilot signal recorded on adjacent information tracks, whereby said scanning means is operable to recover the pilot signal from said storage medium even when the beam of radiation is being directed at a plurality of information tracks simultaneously;

said focusing means including

lens means for directing the beam of radiation at said storage medium,

means for detecting when said beam of radiation is focused on a single information track,

means for initially retracting said lens means to an initial position; and

means operable after said lens means has been retracted to said initial position for moving said lens means relative to said storage medium until it is determined by said focus detecting means that focus of the beam of radiation on the selected information track has been achieved,

said initial position for said lens means being defined by the location at which detection of the pilot signal by said scanning means first ceases as said lens is being retracted, thereby reducing the range over which said lens means must be moved for initial acquisition of focus.

4,374,324

OPTICAL FOCUSSING DEVICE WITH INCLINATION DETECTION

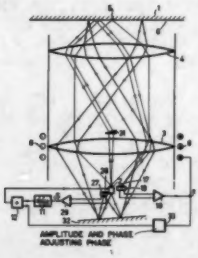
Gerard E. Van Rosmalen, and Willem G. Opheij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,554

Claims priority, application Netherlands, Sep. 2, 1980, 8004969

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. An optical focussing device comprising a radiation source, means for focussing radiation from said source onto an object, means for detecting a focussing error and providing a first signal representative of said focussing error, means for detecting a local inclination of the object relative to a plane normal to an optical axis of said focussing means, said inclination detecting means producing a second signal representative of said inclination, and control means responsive to said first and second signals for moving at least one of said source, focussing means or parts thereof relative to the object so as to reduce the focussing error.

4,374,325

IMAGE INTENSIFIER ARRANGEMENT WITH AN IN SITU FORMED OUTPUT FILTER

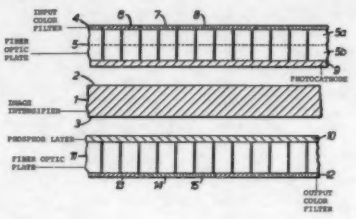
Jonathan R. Howorth, Maldon, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Jul. 11, 1980, Ser. No. 168,339

Claims priority, application United Kingdom, Jul. 11, 1979, 7924200

Int. Cl.³ H01J *31/50*

U.S. Cl. 250—213 VT **5 Claims**



1. A method of forming the output filter of an image intensifier arrangement including an image intensifier device arranged to receive an incident optical image at an input surface thereof and, in response thereto, to produce a re-constituted optical image of greater intensity at an output surface thereof, two optical filters each having a plurality of adjacent co-planar color selective elements of at least two colors with one of said filters being an input filter located adjacent to said input surface in an image receiving path and the other of said filters being an output filter located adjacent to said output surface in an output optical path, and with said two filters being so arranged that light for corresponding points in the incident image and the re-constituted image passes through corresponding color selective elements in the respective filters; said method including: after the image intensifier device and the input filter have been assembled, defining the positions of the individual color selective filter elements of the output filter by illuminating the input filter sequentially with light of different colors which are selectively passed by filter elements of a corresponding color, so as to produce at said output surface a re-constituted image of the individual filter elements of said input filter; and utilizing the re-constituted image to produce said output filter in situ at said output surface.

4,374,326

METHOD FOR DETERMINING THE PROPORTION OF AT LEAST ONE MATERIAL IN A MOVING MIXTURE OF MATERIALS

John S. Wykes, Allenton, and Ian Adsley, Burton-on-Trent, both of England, assignors to Coal Industry (Patents) Limited, London, England

Division of Ser. No. 911,247, May 31, 1978, Pat. No. 4,275,298. This application Aug. 15, 1980, Ser. No. 178,420

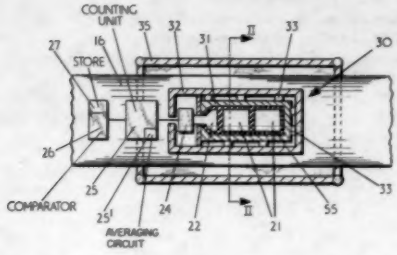
Claims priority, application United Kingdom, May 31, 1977, 22941/77

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—255 **4 Claims**

1. A method of determining the proportion of at least one material in a moving inhomogeneous mixture of coal, and stone or shale materials comprising moving an inhomogeneous mixture of materials past a radiation sensor, shielding the radiation sensor, sensing over a period of time an intensity of radiation emitted by at least one of the materials in the moving mixture, deriving electrical signals indicative of the sensed intensity, compensating for variations in the derived signals due to the inhomogeneity of the mixture by averaging the derived signals and further deriving a signal indicative of averaged intensity of radiation, comparing the further derived averaged radiation

intensity signal with at least one preselected reference value of signal corresponding to a known proportion, and determining



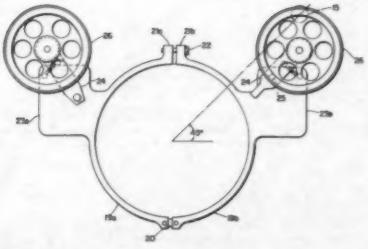
the proportion of said at least one material in the mixture of materials.

4,374,327

DEVICE FOR INDICATING SPECIMEN STAGE POSITIONS IN AN ELECTRON MICROSCOPE

George Christov, 5204 Bangor Dr., Kensington, Md. 20795

Filed Jan. 27, 1981, Ser. No. 228,872
Int. Cl.³ G21K 5/10
U.S. Cl. 250—442.1 5 Claims



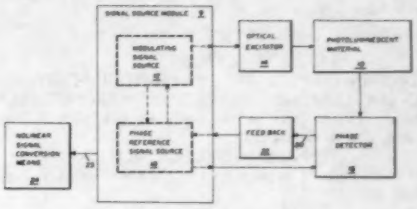
1. A device for indicating positions of a specimen stage in an electronic microscope having manually operated vertical control rods engaging the specimen stage to shift the stage in mutually perpendicular directions, a bracket detachably mountable upon the housing of an electron microscope, a pair of arms pivotally mounted on said bracket, a pair of rotatable circular members each rotatably mounted on a said arm and having peripheral surfaces engaging respectively said control rods and rotating in conjunction with the motion of said control rods, spring means urging respectively each of said arms in a direction to maintain a said circular member in contact with a said control rod, potentiometer means connected to said circular members for generating electrical signals in response to rotary movement of said circular members, and means responsive to said electrical signals for indicating visually reference values designating the position of the stage with respect to said directions.

4,374,328

PHOTOLUMINESCENT INDICATOR

Vincent J. Tekippe, Des Plaines, and Lawrence E. Lach, Chicago, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 27, 1981, Ser. No. 257,825
Int. Cl.³ F21V 9/16; G01J 5/00, 5/48
U.S. Cl. 250—458.1 20 Claims



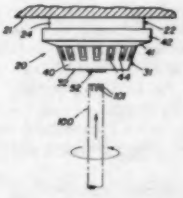
1. A photoluminescent indicator apparatus comprising:
a. a photoluminescent material having a photoluminescent decay rate which varies as a function of environmental conditions;
b. a signal generating means having a phase reference signal means for generating a reference signal, and a signal source means for generating a modulating signal;
c. means for optically exciting a first sample of said photoluminescent material in accordance with a first modulated signal from said modulating signal source to generate an excitation output signal functionally dependent on said first modulating signal and indicative of said environmental conditions;
d. phase-detection means for comparing the difference in phase of said reference signal and said excitation output and for generating a phase differential signal functionally related to the photoluminescent decay rate of said first sample; and
e. feedback means for adjusting said reference signal in accordance with said phase differential signal.

4,374,329

SMOKE DETECTOR WITH TEST APPARATUS

George A. Schoenfelder, Downers Grove; Gerald D. Rork, Sleepy Hollow, and Richard E. Hiltenbrand, Naperville, all of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Apr. 24, 1981, Ser. No. 257,095
Int. Cl.³ G08B 29/00
U.S. Cl. 250—574 32 Claims



1. Test means for a smoke detector device having a light source, light responsive means, and a smoke chamber therebetween, light from the light source being directed through a predetermined scattering region of the smoke chamber and reflected from smoke in the scattering region to the light responsive means for activating an alarm at a predetermined smoke density in the scattering region, said test means comprising: control means shiftable between a normal condition and a test condition, said control means including light reflecting means disposed outside the scattering region, said control

means in the normal condition thereof maintaining said light reflecting means in non-reflective relationship with respect to the light entering the smoke chamber from the light source, said control means in the test condition thereof causing light entering the smoke chamber from the light source to intercept said light reflecting means outside the scattering region and be reflected by said light reflecting means to the light responsive means for causing the light responsive means to respond as if the predetermined smoke density were in the scattering region for actuating the alarm.

4,374,330

CONTROL CIRCUIT FOR A PART WHICH IS MOVED IN AN OSCILLATING MANNER BY AN ELECTRIC DRIVE

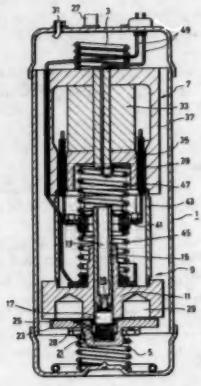
Rainer Fey, Adalbert-Stifter-Strasse 31, D-8720 Schweinfurt, Fed. Rep. of Germany

Filed Aug. 26, 1980, Ser. No. 181,742

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2936018

Int. Cl.³ H01H *47/00*; F04B *17/00*

U.S. Cl. 307—132 E **11 Claims**



1. Control circuit for a part which is movable in an oscillating manner by an electric drive, particularly for a driving coil **39**; **111**; **125**; **129** of a vibration piston compressor, whose vibration piston is spring-mounted, with an oscillator stage **61**; **87** and a driver stage **51**, **53**, **57**; **71,73,75**, **77**, **89** controlled by said oscillator stage **61**; **87** and periodically switching on or off the driving current of the drive and with a current sensor responding to the driving current wherein the frequency of the oscillator stage is selected in such a way that the switching frequency of the driver stage is approximately equal to the natural frequency of said oscillating part, characterized in that a control stage **55,65,59**; **55,65,91,83,85,89** which is connected to a current sensor **55**;**113**; **131** responding to the driving current switches off the current delivered by said driver stage until the start of the next driving current phase of said oscillator stage when the driving current exceeds a predetermined value.

4,374,331

D-TYPE FLIP-FLOP CIRCUIT

Yuji Yamamoto, Fujisawa, and Sei Shiragaki, Yamato, both of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1981, Ser. No. 227,562

Claims priority, application Japan, Jan. 24, 1980, 55-6355

Int. Cl.³ H03K *3/037, 3/286*

U.S. Cl. 307—291 **2 Claims**

1. A flip-flop circuit comprising:

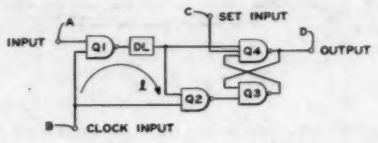
a first NAND gate having a pair of input terminals and an output terminal;

means for coupling an input signal to one of said pair of first NAND gate input terminals;

means for coupling a clock signal to the other of said pair of first NAND gate input terminals;

a second NAND gate having a pair of input terminals and an output terminal;

means for coupling said output terminal of said first NAND gate to one of said pair of second NAND gate input terminals;



means for coupling said clock signal to the other of said pair of said second NAND gate input terminals;

a non-synchronous flip-flop circuit having a set input terminal and a reset input terminal;

means for coupling said output of said first NAND gate to said set input terminal and means for coupling said output of said second NAND gate to said reset input terminal; and

a delay circuit connected between the input of said second NAND gate and the output of said first NAND gate.

4,374,332

CASCADE TYPE CMOS SEMICONDUCTOR DEVICE

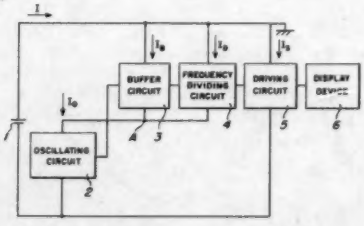
Nobuo Inami, and Kojiro Tanaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sep. 16, 1980, Ser. No. 187,747

Claims priority, application Japan, Sep. 18, 1979, 54-11979

Int. Cl.³ H03K *3/354*; H01L *27/04*; G04C *10/00*

U.S. Cl. 307—304 **6 Claims**



1. A CMOS semiconductor device, comprising:

a first CMOS circuit having input, output and power terminals and comprising a CMOS transistor pair having the source of one transistor and the drain of the other transistor connected together at a node to define said output terminal and for connecting the respective transistor channels in series, having the respective gates of said transistors connected together to define said input terminal, and wherein the drain of said one transistor and the source of said other transistor define said power terminals;

a second CMOS circuit having input, output and power terminals and comprising a CMOS transistor pair having the source of one transistor and the drain of the other transistor connected together at a node to define said output terminal and for connecting the respective transistor channels in series, having the respective gates of said transistors connected together to define said input termi-

nal, and wherein the drain of said one transistor and the source of said other transistor define said power terminals;

respective power terminals of said first and second CMOS circuits being connected together so that the channels of their respective CMOS transistor pairs are connected in series;

a signal lead free of reactive circuit elements and connecting said output terminal of said CMOS transistor pair of said first CMOS circuit to said input terminal of said CMOS transistor pair of said second CMOS circuit; and

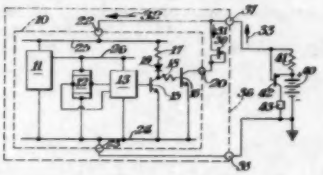
wherein said transistors comprising said CMOS transistor pairs have respective threshold voltage values effective to allow signal transmission from said output terminal to said input terminal substantially without current flow between said first and second CMOS circuits.

4,374,333

TWO TERMINAL HALL-SENSOR

Grant D. Avery, Loudon, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 27, 1980, Ser. No. 153,800
Int. Cl.³ H03K *3/01, 19/18*
U.S. Cl. 307—309 **5 Claims**



1. A two terminal Hall-sensor comprising:

(a) a Hall-element;

(b) a threshold detector means being connected to the output of said Hall-element for providing two distinctly different output signals in response to a low and a high range of magnetic field ambients at said Hall-element, respectively;

(c) a voltage regulator means for supplying a substantially constant DC voltage to said Hall-element and to said threshold detector;

(d) a pair of DC voltage supply terminals being connected to the input of said voltage regulator; and

(e) a constant current load means for drawing a substantially constant current of a predetermined value from said pair of DC voltage supply terminals in response to one of said detector means output signals and for drawing substantially less current in response to the other of said detector means output signals whereby the magnitude of the supply current flowing through said DC supply terminals provides unambiguous indications respectively of said high and low ambient magnetic field range.

4,374,334

SIGNAL COMPARATOR APPARATUS

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,541
Int. Cl.³ H03K *5/24;* **H01L** *29/78*
U.S. Cl. 307—355 **5 Claims**

1. In combination,

a semiconductor substrate of one conductivity type having a major surface,

a first storage electrode insulatingly overlying a first storage region of said substrate adjacent said major surface,

a first gating electrode insulatingly overlying a first barrier region of said substrate adjacent said major surface and coupled to said first storage region,

a first region of opposite conductivity type in said major surface and coupled to said first barrier region,

a second storage electrode insulatingly overlying a second storage region of said substrate adjacent said major surface,

a second gating electrode insulatingly overlying a second barrier region of said substrate adjacent said major surface and coupled to said second storage region,

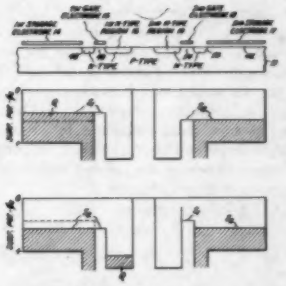
a second region of opposite conductivity type in said major surface and coupled to said second barrier region,

means for applying during a first period of time a first voltage signal to said first gating electrode to establish in said first barrier region a surface potential corresponding to the level of said first voltage signal,

means for applying during said first period of time a second voltage signal to said second gating electrode to establish in said second barrier region a surface potential corresponding to the level of said second voltage signal,

means for applying a first storage voltage to said first and said second storage electrodes sufficient to establish surface inversion in said first and said second storage regions at the surface potentials of said first and said second barrier regions produced by said first and second voltage signals,

means for providing charge to said first storage region sufficient to establish equilibrium of potentials between said first storage region and said first barrier regions,



means for providing charge to said second storage region sufficient to establish equilibrium of potentials between said second storage region and said second barrier region,

means for charging said first region of opposite conductivity type and said second region of opposite conductivity type to a predetermined potential which is energetically lower for minority carriers in said substrate than the surface potentials of said first and second barrier regions during said first period,

means for electrically isolating said first and second regions of opposite conductivity type from said charging means during a second period of time,

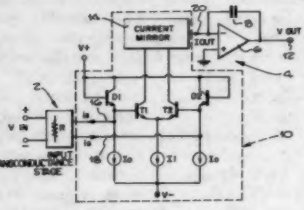
means for disconnecting said first voltage signal from said first gating electrode and said second voltage signal from said second gating electrode during a first subperiod of said second period,

means for connecting said first voltage signal to said second gating electrode and for connecting said second voltage signal to said first gating electrode during a succeeding second subperiod of said second period, whereby charge flows into one of the regions of opposite conductivity type during the second subperiod of said second period changing the potential thereof with respect to the other of said regions of opposite conductivity type if the surface potential of the one of said first and second barrier regions adjacent thereto is energetically lowered in potential for minority carriers in said substrate.

4,374,335
TUNEABLE LC. ACTIVE INTEGRATOR

Kiyoshi Fukahori, and Yukio Nishikawa, both of San Jose, Calif., assignors to Precision Monolithics, Inc., Santa Clara, Calif.

Filed May 19, 1980, Ser. No. 151,419
Int. Cl.³ H03H 11/12; H03L 7/08
U.S. Cl. 307—521 5 Claims



1. An adjustable integrated circuit integrator circuit, comprising:

an input stage means characterized by a predetermined transconductance, and including means to receive an input voltage signal, and means to establish an output current signal which is related to the input voltage signal by said predetermined transconductance,

a conditioning stage means comprising a Gilbert multiplier circuit which is connected to receive said output signal from said input stage means, and in response thereto to establish a conditioned output signal, said Gilbert multiplier circuit having an adjustable current source means comprising I_0 and I_1 current sources and being adapted to receive an adjustment signal and, in response thereto, to adjust the conditioned output signal, the current output of said stage comprising the current output from the input stage multiplied by I_1/I_0, and

an integrating stage means connected to receive the conditioned output signal from the conditioning stage means and in response thereto to provide an integrated output signal,

said integrating stage means together with said conditioning and input stage means establishing an integration time constant for the integrator circuit, said conditioning stage means including means for controllably adjusting its conditioned output signal, and thereby adjusting the integration time constant of the circuit.

4,374,336
FLAT MOTOR

Tokuo Shimizu, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

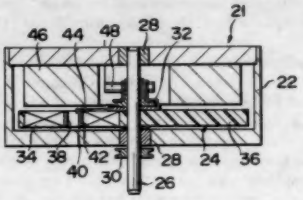
Filed May 27, 1981, Ser. No. 268,091
Claims priority, application Japan, Jun. 3, 1980, 55-74510; Jun. 3, 1980, 55-74511
Int. Cl.³ H02K 21/26
U.S. Cl. 310—154 6 Claims

1. A flat motor comprising:

a rotor including a shaft and a plurality of coils arranged concentric with said shaft, each of said coils comprising a winding having a predetermined diameter and an end, the position of the end of said winding being set at a predetermined distance from said shaft;

a magnet having an internal opening and an inner periphery surrounding said internal opening, said inner periphery of said magnet being spaced apart from said shaft by a distance smaller than said predetermined distance; and

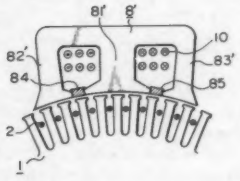
a ring-like connector plate provided on said rotor and extending between said rotor and said magnet, the end of the winding of each said coil being electrically connected to said connector plate, said connector plate having a thickness at least smaller than said predetermined diameter of said winding of each said coil.



4,374,337
DIRECT CURRENT MOTOR HAVING E-SHAPED INTERPOLES

Yoshinori Kokzai, Hino; Shigeaki Oyama, Hachioji, and Tatsuo Koyama, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 233,963
Claims priority, application Japan, Feb. 12, 1980, 55-15674
Int. Cl.³ H02K 3/16
U.S. Cl. 310—186 4 Claims



1. A direct current motor comprising an armature having armature windings wound thereon and rotating around the central axis thereof, a plurality of main magnetic poles disposed around said armature having field windings wound thereon, and a plurality of E-shaped interpoles disposed at the intermediate position along the outer circumference of said armature between the adjacent magnetic poles, each of said E-shaped interpoles having two side poles and a center pole to which an interpole winding is wound, characterized in that each of said E-shaped interpoles further comprises interconnecting members which are made of a material having rigidity and which are tightly and irremovably wedged in gaps between said center pole and said side poles, thereby mechanically interconnecting said side poles to said center pole to prevent vibrations of the side poles.

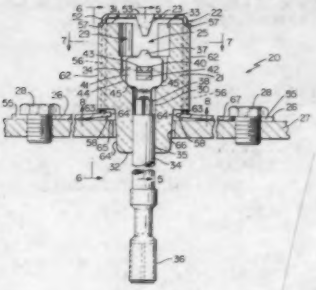
4,374,338
IGNITER STRUCTURES AND METHODS OF MAKING THE SAME

Harvey J. Shopsky, Latrobe, Pa., assignor to RobertShaw Controls Company, Richmond, Va.

Filed Aug. 18, 1980, Ser. No. 178,810
Int. Cl.³ H01T 13/20
U.S. Cl. 313—142 51 Claims

1. In a combination of an igniter insulating body and an outer target bracket that has a target electrode adapted to be disposed in spaced relation to an igniter electrode carried by said igniter body to define a spark gap therewith and that has mounting means for securing said bracket to a frame means adjacent said igniter body to provide said spark gap, said target bracket having holding means holding said igniter body

therein to provide a self-contained assembly that can be subsequently secured as a single unit to said frame means by said mounting means of said target bracket, the improvement wherein said target bracket has slot means therethrough defining opposed surface means of said target bracket, said igniter body having abutment means projecting out through said slot means, said holding means comprising cantilevered tab means of said target bracket engageable with said abutment means and defining one of said opposed surface means of said bracket.



4,374,339

HIGH-PRESSURE SODIUM VAPOR DISCHARGE LAMP

Peter A. W. Tielemans, and Cornelis A. J. Jacobs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

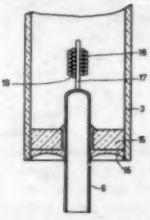
Filed May 19, 1980, Ser. No. 151,500

Claims priority, application Netherlands, May 28, 1979, 7904158; Jan. 18, 1980, 8000326

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ H01J *61/073, 61/22*

U.S. Cl. 313—218 **1 Claim**



1. A high-pressure sodium vapor discharge lamp having a sealed ceramic discharge vessel containing sodium, mercury and rare gas, in which the weight ratio Na/Hg is from 1/1 to 1/9 and the sodium pressure during operation at design voltage is from 4×10^4 to 10.7×10^4 Pa, current supply conductors extending through the wall of said discharge vessel to tungsten electrodes accommodated inside the discharge vessel, characterized in that an emitter is present on the electrodes which substantially consists of oxygen-bound strontium and oxygen-bound tungsten with the molar ratio of strontium to tungsten being from 3/1 to 50/1 and in which discharge vessel the rare gas pressure at 300° K. is between 1333 and 1333×10^2 Pa.

4,374,340

LOW PRESSURE DISCHARGE LAMP

Albert Bouwknegt, and Petrus C. Lauwerijssen, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,930

Claims priority, application Netherlands, Apr. 3, 1979, 7902572

Int. Cl.³ H01J *17/16, 61/30, 17/18*

U.S. Cl. 313—220 **4 Claims**

1. A low-pressure mercury vapor discharge lamp which comprises:

a discharge vessel comprising a plurality of parallel tubular portions, first and second spaced electrodes disposed in said vessel, an ionizable medium in said vessel and means for limiting the pressure in said vessel during operation of said lamp, said means including each tubular portion having an integral collar, said collars of the respective tubular portions being sealed around respective apertures in a wall of the respective tubular portions, said collars of the respective tubular portions being interconnected to form a continuous series passage through said tubular portions, the axis of said collars extending substantially transversely to the parallel axis of the tubular portions, the discharge passing through said collars and at least the major part of each tubular portion during operation of the lamp, said collars of said tubular portions being mutually engaged, at least one of said collars being disposed at a distance from the nearer end of the tubular portion on which it is disposed of one to four times the inner diameter of one of said tubular portions.

4,374,341

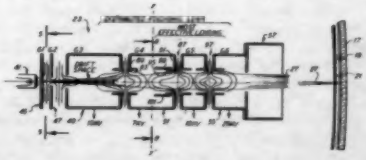
BEAM FOCUSING MEANS IN A UNITIZED TRI-POTENTIAL CRT ELECTRON GUN ASSEMBLY

Donald L. Say, Waterloo, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,308

Int. Cl.³ H01J *29/50, 29/56*

U.S. Cl. 313—414 **5 Claims**



1. A beam focusing improvement in a CRT plural beam tri-potential in-line electron gun assembly embodying a center and two side-related gun structures for use in a color tube having a forwardly positioned cathodoluminescent screen, each of said guns having individual coordinate beam path axes therethrough with the "x" axes thereof oriented in a common horizontal plane, said gun assembly being a construction of

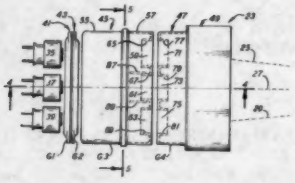
unitized in-line apertured electrode members sequentially positioned forward of individual electron producing cathode elements to provide for each gun an initial beam forming electrode (G1) embodying a discrete substantially elongated aperture-related beam shaping configuration therein whereof the major axis of said configuration is substantially coincident with the "y" axis of said gun structure, an initial beam accelerator electrode (G2), a first high focusing electrode (G3), a low focusing electrode (G4) having a longitudinal dimension defined between rear and forward apertured portions, a second high focusing electrode (G5), and a final accelerator electrode (G6), the "G3–G6" region forming a distributed focusing lens for said beam; said improvement relating to means for particularly modifying that portion of the beam lensing field associated with the forward end of said low focusing electrode (G4) of at least one of said gun structures in said assembly wherein the inherent substantially ovate cross-sectional shaping of the beam, having a major dimension substantially coincident with the "x" axis of said gun structure, is modified to provide a focused substantially circular beam spot at the center of said screen, said improvement comprising: a pair of substantially planar metallic sideboard elements oriented in standing parallel positions in a manner to project inwardly within said low focusing electrode (G4) and being substantially perpendicular to the interior surface of said forward end thereof, one of said sideboard elements being oriented on either side of the center forward aperture in planes substantially parallel with the "x" axis of said gun structure, said orientation effecting positional adjustment of the equipotential lines in the most effective "G4–G6" area of the distributed focusing lens formed spatially within the "G3–G6" region to provide substantially symmetrical lensing for focusing said respective electron beam.

4,374,342

FOCUSING MEANS IN A UNITIZED BI-POTENTIAL CRT ELECTRON GUN ASSEMBLY

Donald L. Say, Waterloo, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,312
Int. Cl.³ H01J *29/50, 29/56*
U.S. Cl. 313—414 **7 Claims**



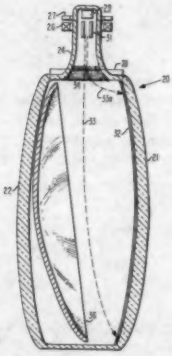
1. A beam focusing improvement in a CRT plural beam bi-potential in-line electron gun assembly embodying a center and two side-related guns for use in a color tube having a forwardly positioned cathodoluminescent screen, each of said guns having a beam path axis therethrough oriented in a common horizontal plane, said gun assembly being a construction of unitized in-line apertured electrode members sequentially positioned forward of individual electron producing cathode elements to provide for each gun an initial beam forming electrode (G1), an initial beam accelerator electrode (G2), a main focusing electrode (G3) having a longitudinal dimension defined between rear and forward apertured ends, and a final accelerator electrode (G4); said improvement relating to means for modifying the lensing field associated with the main focusing of the electron beam traversing at least one of said guns wherein the inherent substantially ovate cross-sectional shaping of the beam is modified to provide a focused substantially circular beam spot at the center of said screen; said improvement comprising: a pair of inserts in the form of substantially planar metallic sideboard elements oriented in standing parallel positions in a manner to project inwardly within said final focusing electrode (G3) and being substantially perpendicular to the interior surface of said forward end thereof, one of said sideboard elements being oriented on either side of the respective forward aperture in a manner to adjust positioning of the equipotential lines inherent in the main lensing field spatially formed within the region to provide substantially symmetrical lensing for the main focusing of said respective electron beam.

4,374,343

THIN KINESCOPE AND ELECTRON BEAM REFLECTOR THEREFOR

Kern K. N. Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1980, Ser. No. 180,899
Int. Cl.³ H01J *29/72, 31/08*
U.S. Cl. 313—422 **4 Claims**



1. A thin kinescope comprising:

a faceplate, a backplate, a screen on the inside surface of said faceplate, an electron gun for providing electrons, and a neck for housing said electron gun arranged so that an undeflected electron beam from said gun initially travels generally parallel to the plane of said screen, a yoke for horizontally and vertically deflecting said electron beam to scan said screen,

a bowl-shaped reflector for focusing said electron beam positioned between and spaced from said faceplate and said backplate and oriented with the concave side facing said faceplate so that electrons from said gun travel along said faceplate between said reflector and said faceplate and are reflected toward said screen by said reflector, said reflector being tilted with respect to said faceplate so that the displacement between said reflector and said faceplate decreases in the direction of electron travel;

a quadrupole having a shunted divergent action for increasing said horizontal deflection and;

a deflection enhancement lens for enhancing said horizontal and vertical deflection.

4,374,344

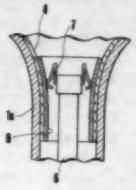
COLOR PICTURE TUBE WITH ELECTRICALLY CONDUCTIVE FRIT FILM ON ENVELOPE SURFACE

Masayoshi Misono, Chiba, and Shigeki Kitamura, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 179,476
Claims priority, application Japan, Aug. 22, 1979, 54-106087
Int. Cl.³ H01J *29/88*
U.S. Cl. 313—479 **9 Claims**

1. In a color picture tube comprising a vacuum envelope constituted by a panel portion, a funnel portion and a neck tube, an electron gun structure housed in the neck tube, an

electrically conductive film coated on the inner wall surface of the envelope and extending from the funnel portion to the neck tube, and an electrically conductive spacer having one end secured to the electron gun structure and the other end in

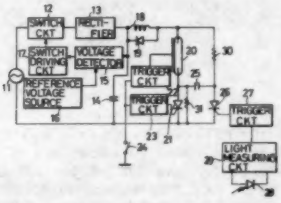


contact with the conductive film, the improvement wherein a portion of the conductive film which makes contact with the conductive spacer comprises an electrically conductive frit film made of a mixture of an electrically conductive material and frit glass.

4,374,345
ELECTRONIC FLASH APPARATUS

Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,940
Claims priority, applicatioe Japan, Feb. 29, 1980, 55-24781
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—241 P **7 Claims**

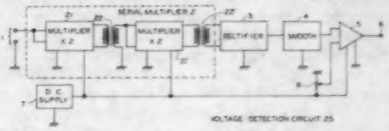


1. An electronic flash apparatus comprising:
an electronic flash tube;
a main capacitor for supplying discharge energy to said electronic flash tube;
a power source circuit connected to said electronic flash tube and to said main capacitor, for charging said main capacitor;
a voltage detecting circuit for detecting the voltage on said flash tube or said main capacitor;
control signal generating means for generating an output signal when the detection voltage of said voltage detecting circuit reaches a discharge continuous voltage, at which time said flash tube is continuously discharged; and
switch means provided in said power source circuit, for inhibiting the power supply from said power supply circuit to said main capacitor and flash tube in response to the output signal from said control signal generating means for a predetermined period of time.

4,374,346
VOLTAGE DETECTION CIRCUITS FOR A-C POWER SUPPLIES

Takuichi Tsuchiya, and Hiroshi Togo, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1980, Ser. No. 123,828
Claims priority, application Japan, Feb. 27, 1979, 54-22118
Int. Cl.³ H05B *41/16, 41/24*
U.S. Cl. 315—276 **12 Claims**



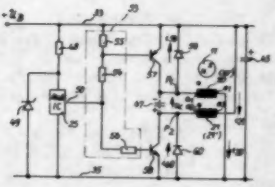
1. A voltage detection circuit for an a-c power supply for a traveling wave tube, said voltage detection circuit comprising means for frequency-multiplying an a-c signal from said a-c power supply, means for rectifying the output of said frequency-multiplying means, means for smoothing the output of said rectifying means, and voltage comparison means for comparing the output voltage of said smoothing means with a predetermined reference voltage to provide a control signal responsive to the comparison at the output of said detection circuit.

3. A method of controlling electrical a-c power supplies which supply an a-c output having a predetermined frequency for a traveling wave tube, said method comprising the steps of:
a. receiving the a-c output;
b. multiplying the frequency of said received a-c output to provide a signal having a frequency which is higher than said predetermined frequency;
c. converting said multiplied frequency to a control voltage signal having amplitude fluctuations corresponding to fluctuations in the a-c output;
d. comparing the voltage of said control voltage signal with a reference voltage; and
e. signalling differences exceeding a predetermined level responsive to said comparison.

4,374,347
BRUSHLESS D-C MOTOR SYSTEM

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,059
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010435
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—138 **18 Claims**



1. Two-pulse, two-filament brushless d-c motor system having
a stator (15); d-c current supply means having two terminals (33,35);
a permanent magnet rotor (11);
rotor position sensing means (25) providing an output signal positioned on the stator and sensing a predetermined orientation of a magnet pole of the rotor with respect to the stator;

armature winding means including two winding strands or filaments (20, 21; 20', 21') wound on the stator, said winding strands or filaments being inductively coupled;

and control circuit means (42) including controlled semiconductor switch means (57, 58; 69, 75; 80, 81) connected to said winding strands or filaments to control pulsed current flow, alternately, through the respective winding strands or filaments,

wherein,

said semiconductor switch means are of respectively opposite, complementary conduction characteristics (pnp: 57, 69, 80; npn: 58, 75, 81);

one terminal (a2) of one winding strand or filament (21, 21') being connected through the main current carrying path of one of said semiconductor switch means (npn: 58, 75, 81) with one terminal (35) of the current supply means;

a similarly acting terminal (a1) of the other winding strand or filament (20, 20') being connected through the main current carrying path of the other, complementary semiconductor switch means (pnp: 57, 69, 80) to the other terminal (33) of the current supply means;

the other terminal (e1) of said one winding strand or filament (21, 21') being connected with the other terminal (35) of the current supply means;

the other terminal (e2) of said other winding strand or filament (20, 20') being connected with said one terminal (33) of the current supply means;

said one inding strand or filament (21, 21') and said other winding strand or filament (20, 20') being tightly a-c coupled together at least at the terminal end portions thereof connected to the respective controlled semiconductor switch means;

wherein, further, said control circuit means includes output connection means (50) and coupling circuit means (53; 65, 68, 74; 82, 87, 89) connecting output signals from the rotor position sensor means to the control terminal of said complementary controlled semiconductor switch means for alternatingly controlling conduction of the respective switch means to cause pulsed current flow through the respective winding strand or filament from said current supply means,

and wherein unilateral conduction means (59, 60; 80, 81'') are provided, respectively connected across the controlled semiconductor switch mens (57, 59, 80; 58, 75, 81) and polarized reversely with respect to said semiconductor switch means to recapture inductive energy stored in the respective winding strands or filaments upon turn-off of current flow therethrough during commutation by the pulsed current flow as controlled by said controlled semiconductor switch means.

4,374,348

WIPER DEVICE

Kiichiro Shimura, Tokyo; Takeo Tamura; Takayoshi Kido, both of Yokohama; Hiroshi Hara, Funabashi, and Morimasa Tanaka, Atsugi, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Ichiko Industries Limited, Tokyo, both of, Japan

Filed Jul. 3, 1980, Ser. No. 165,704

Claims priority, application Japan, Jul. 6, 1979, 54-85091

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—443 **10 Claims**

1. A wiper device comprising:

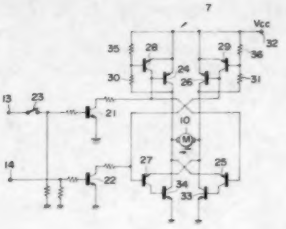
a wiper blade;

a wiper arm supporting said wiper blade at one end thereof;

a driving means being reversible to drive in first and second directions and connected to said wiper arm so that it can alternately drive said wiper arm in first and second directions;

a control circuit connected to said driving means, said control circuit including a switching means for switching a connection of an electric power supply between first and second circuit connections so as to alternately drive said driving means in said first and second directions; and

a wiper position detecting means for detecting both of predetermined ends of wiper motion in first and second directions, said wiper position detecting means being connected to said switching means so that when said wiper position detecting means detects said end of wiper motion in said first direction, said switching means switches the connection of the power supply from the first connection to the second connection and when said wiper position detecting means detects said end of wiper motion in said second direction, said switching means switches the connection of the power supply from the second connection to the first connection, said wiper position detecting



means including a rotatable element connected to said wiper arm in order to rotate in first and second directions corresponding to said wiper motion and a pair of contacts connected to said switching means of said control circuit and defining both ends of motion of said rotatable element, the first contact of said contacts being located to detect the end of wiper motion in said first direction and the second contact being located to detect the end of wiper motion in said second direction, said rotatable element including an electrically conductive member connected for receiving applied electric potential so that it can alternately apply an electric potential to either one of said contacts for activating said switching means to switch the connection of supplied power between the first connection and the second connection.

4,374,349

CONTROL SYSTEM FOR AN INDUSTRIAL ROBOT

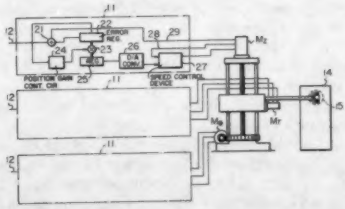
Hajimu Inaba, and Hideo Miyashita, both of Hino, Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Aug. 20, 1981, Ser. No. 294,797

Claims priority, application Japan, Sep. 1, 1980, 55-119827

Int. Cl.³ G05B *13/00*

U.S. Cl. 318—568 **2 Claims**



1. A control system for an industrial robot having a set of motors for driving the industrial robot and a set of control circuits for controlling said motors, each of said control circuits comprising:

an adder for receiving a position command input signal and a position feedback signal from a corresponding motor;

an error register for receiving the output signal of said adder means;

a position gain control circuit for receiving the output of said error register;

a position gain multiplier for receiving an output signal of said error register and the output signal of said position gain control circuit;

a register for receiving the output signal of said position gain multiplier;

a digital-analog converter for receiving the output signal of said register; and

a speed control device for receiving the output signal of said digital-analog converter and supplying signals to the corresponding motor;

wherein the multiplication factor of said position gain multiplier is increased when said motor is stopped or gets ready to be stopped and an error value held in said error register becomes higher than a predetermined value.

4,374,350

CONTROL SYSTEM FOR STOPPING SPINDLE AT PREDETERMINED ROTATIONAL POSITION

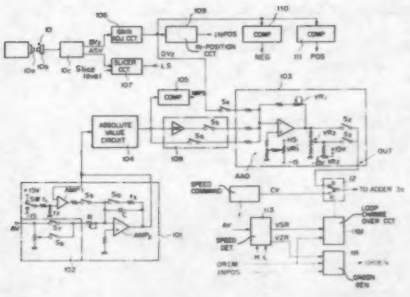
Yoshinori Kohzai; Yoshiki Fujioka, and Naoto Ota, all of Hino, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,836

Claims priority, application Japan, Dec. 31, 1979, 54-172681

Int. Cl.³ G05B *11/18*

U.S. Cl. 318—590 **15 Claims**



1. A control system for stopping a spindle at a predetermined rotational position, for driving a spindle with a spindle motor through a speed change mechanism, having a speed change ratio, in such a manner that a positional deviation between a present rotational position of a specified point on the spindle and the predetermined rotational position at which the specified point is to be stopped, is reduced to zero, thereby stopping the specified point on the spindle at the predetermined rotational position, said control system comprising means, operatively connected to the spindle and to the spindle motor, for generating a positioning gain by dividing the speed of the spindle motor by an amount of spindle motor rotation which depends upon the positional deviation of the spindle, said positioning gain being generated so as to remain substantially constant regardless of the speed change ratio established between the spindle motor and the spindle by said speed change mechanism, thereby stopping the specified point on the spindle at the predetermined rotational position.

4,374,351

DIGITAL DRIVE UNIT REGULATOR

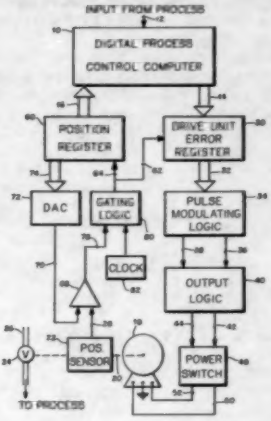
Walter Fishman, Hatfield, and Theron W. Jenkins, Jr., Ambler, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Dec. 9, 1980, Ser. No. 214,617

Claims priority, application United Kingdom, Jan. 9, 1980, 8000626

Int. Cl.³ G05B *19/26*

U.S. Cl. 318—600 **6 Claims**



1. Apparatus for controlling the position of an electric drive unit in response to periodically produced digital control signals indicative of the position change required for the drive unit during the period, comprising:

a first register for receiving said digital control signal and changing the magnitude of its stored value accordingly;

means for supplying power to said drive unit in an amount proportional to said stored value so as to move said drive unit in a direction and by an amount corresponding respectively to the sign and magnitude of said stored value;

a second register for storing a value indicative of the position of said drive unit;

a digital to analog converter for producing from the contents of said second register an analog signal representing the existing position of said drive unit;

means for producing an analog signal representing the actual position of said drive unit;

a clock source;

gating means operable to gate clock signals from said clock source to said first and second registers to step said first and second registers as necessary to update their contents;

a comparator for comparing said analog signal from said converter with said actual position signal, said comparator being connected with said gate means to cause said gate means to step said registers until said converter signal and said actual position signal are equal.

4,374,352

AC INDUCTION MOTOR BRAKING SYSTEM

Douglas G. Webster, Saratoga, Calif., assignor to Veeco/Macronetics Inc., Sunnyvale, Calif.

Filed Jul. 21, 1981, Ser. No. 285,588

Int. Cl.³ H02P *3/24*

U.S. Cl. 318—762 **3 Claims**

1. An electronic braking system for an AC induction motor comprising:

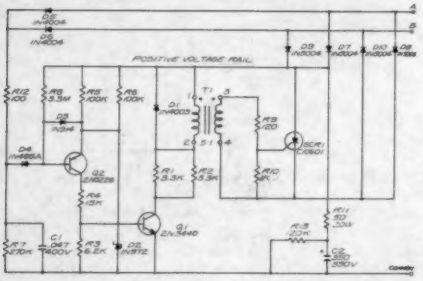
(a) first means connected across the windings of said motor, said first means including a first diode connected in series with a first capacitor, said first capacitor storing energy

derived from the AC voltage applied to the windings of said motor;

(b) second means connected across the windings of said motor, said second means including a second resistor connected in parallel with a second capacitor, said second capacitor sensing when the applied AC voltage is removed from the windings of said motor;

(c) third means connected across said first diode, said third means including controllable unidirectional electronic switching means operable between a non-conducting state and a conductive state and oriented to permit current to flow in a direction opposite to the direction of current flow in said first diode; and

(d) fourth means operatively connected to said second capacitor for selectively controlling the switching of said controllable unidirectional electronic switching means from the non-conducting state to the conducting state, said fourth means including transistor switching means



operable between an off state and an on state and pulse transformer means, said transistor switching means operatively connected and responsive to the voltage across said second capacitor and switching from the off state to the on state in response to the removal of the AC voltage applied to the windings of said motor, said pulse transformer means operatively connected to said first capacitor, to said transistor switching means, and to said controllable unidirectional electronic switching means, said pulse transformer means providing in response to the switching of said transistor switching means from the off state to the on state a control signal to said controllable unidirectional electronic switching means causing said controllable unidirectional electronic switching means to switch from the non-conducting state to the conducting state, said controllable unidirectional electronic switching means in the conducting state providing a path for the energy stored in said first capacitor to be transferred to the windings of said motor and to effect eddy-current braking of said motor.

4,374,353

MULTIPLE SPEED CONTROL MEANS FOR A VARIABLE SPEED MOTOR SYSTEM

Victor J. Habisohn, 1075 Englewood Rd., Hoffman Estates, Ill. 60195

Continuation-in-part of Ser. No. 787,348, Apr. 14, 1977, Pat. No. 4,207,508. This application Jun. 10, 1980, Ser. No. 158,166

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—799 **4 Claims**

1. A hoist control system for moving a load from one position to another position, comprising:

an alternating current ("AC") power source;

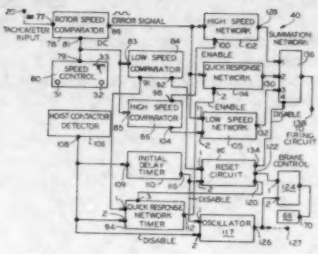
a motor means for driving said load;

a static switching network having an input and an output, the output of said network being connected to the motor means;

a power switch means interposed between the AC power source and the input of the static switching network for connecting the AC power source thereto;

a mechanical switch member having a plurality of fixed positions and a variable low speed position;

a voltage level selector means including means for detecting AC voltage and converting to a DC signal corresponding to the selected fixed speed of the motor and including means for providing variable DC signals corresponding to



incremental variations of the low speed of the motor, said voltage level selector means providing said fixed speed signal when the switch means is in any one of said fixed positions and providing said DC signal corresponding to said incremental variations when said switch member is in the variable low speed position, and said voltage selector being inhibited from providing said low speed DC signals when the switch member is in any of said fixed positions.

4,374,354

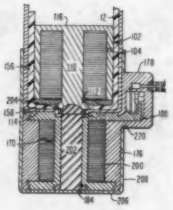
RECHARGEABLE ELECTRIC PORTABLE APPLIANCE

John E. Petrovic, and John Trenary, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Jun. 23, 1981, Ser. No. 276,507

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—2 **12 Claims**



1. A portable appliance comprising:

a housing of said appliance that contains electrically powered apparatus, a battery for energizing said apparatus and a secondary coil of electrically-conductive winding that is coupled to translate magnetically-induced energy to said battery;

an elongated core of magnetically-permeable material disposed within said secondary coil;

a base that defines a well for supporting the portion of said housing within which said secondary coil is positioned and which includes a primary coil of electrically-conductive winding that is responsive to applied power for magnetically inducing energy into said secondary coil;

an elongated stud of magnetically-permeable material disposed within said primary coil, said stud being aligned axially with said core and having an end portion adjacent to an end portion of said core, one of said end portions being generally cup shaped and the other of said end

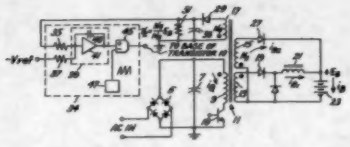
portions being formed and relatively oriented to nest within said one end portion.

4,374,355

ELECTRICALLY ISOLATED BATTERY CHARGER FOR ON-BOARD ELECTRIC VEHICLE APPLICATIONS

Robert L. Steigerwald, Scotia, and John N. Park, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,725
Int. Cl.³ H02J 7/10
U.S. Cl. 320—43 **1 Claim**



1. An electrically isolated battery charger comprising:
rectifier means adapted to be connected to an external AC supply;
a four winding transformer having a primary winding, two secondary windings and a signal winding;
controllable switch means connected between said rectifier means and said primary winding for cyclically interrupting the power delivered to said primary winding;
a choke;
a first diode connected in series with one of said secondaries, said choke and a battery to be charged, said first diode poled so that power is delivered to the choke and the battery when said controllable switch means is on, and when said controllable switch means is off energy stored in said choke is delivered to the battery;
a second diode connected in series with the other of said secondaries and the battery to be charged said second diode poled so that energy stored in said transformer core and airgap is delivered to the battery when said controllable switch means is off and no energy is delivered by said other secondary when said controllable switch means is on;
battery peak detector means coupled to said signal winding for obtaining a signal proportional to the battery voltage while said battery is being charged and said controllable switch is off; and
battery charge rate regulator means coupled to the output of said battery peak detector means for controlling the duty cycle of said controllable switch means to control battery charging.

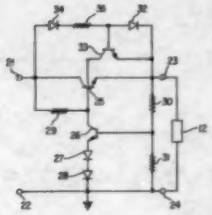
4,374,356

CONSTANT VOLTAGE CIRCUIT

Masaru Hashimoto, Ayase, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaka, Japan

Continuation-in-part of Ser. No. 284,671, Jul. 20, 1981, abandoned, which is a continuation of Ser. No. 68,401, Aug. 21, 1979, abandoned. This application Aug. 31, 1981, Ser. No. 298,104
Claims priority, application Japan, Sep. 4, 1978, 53-108326
Int. Cl.³ G05F 1/56
U.S. Cl. 323—273 **6 Claims**

5. A constant-voltage circuit comprising:
first and second input terminals for supplying an input voltage;
first and second output terminals for outputting a constant voltage;
a first transistor having a base, a collector connected to the first input terminal, and an emitter connected to the first output terminal;
a second transistor having a base, and collector and emitter connected between the base of the first transistor and the second input terminal;
means for applying a current in response to the input voltage to a connecting point of the first and second transistors;
a current mirror circuit comprising,
a series circuit including at least a resistive means and a PN junction means connected in series across the first input terminal and the first output terminal to form a first current path therebetween;
a third transistor having a base connected to the interconnection between the resistive means and the PN junction means of said first current path, and emitter and collector



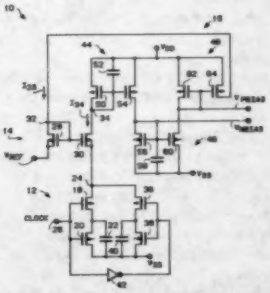
terminals connected between the connection point of said first and second transistors and said first output terminal to form a second current path which is also connected to the said applying means, and
said PN junction means of said first current path connected across the base and emitter of said third transistor;
output sensing means connected to said output terminals for applying a signal in response to the voltage across said output terminals to the base of said second transistor,
whereby an output voltage across said first and second output terminals is stabilized in relation to variation of an input voltage across said first and second input terminals.

4,374,357

SWITCHED CAPACITOR PRECISION CURRENT SOURCE

Andrew Olesin; Kevin K. L. Luke, both of Austin, and Robert D. Lee, Denton, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 27, 1981, Ser. No. 286,446
Int. Cl.³ G05F 1/46
U.S. Cl. 323—351 **11 Claims**



1. A switched capacitor precision current source for providing a precision current via an output node, comprising:
capacitance means for storing charge;
current means for receiving a first reference voltage and for sourcing current from the output node to a charge node so long as the voltage on the charge node is less than a sec-

ond reference voltage which is proportional to the first reference voltage;

charging means for charging the capacitance means from the charge node during a charge period; and

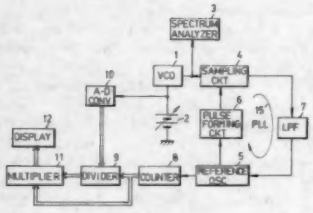
discharging means for discharging the capacitance means during a discharge period.

4,374,358

APPARATUS FOR MEASURING THE OSCILLATION FREQUENCY OF A VOLTAGE CONTROLLED OSCILLATOR

Masaaki Hirose, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1981, Ser. No. 222,663
Claims priority, application Japan, Jan. 9, 1980, 55-1478
Int. Cl.³ G01R 23/02
U.S. Cl. 324—78 D **9 Claims**



1. Apparatus for measuring the oscillation frequency of a voltage controlled oscillator controlled by a control voltage, comprising:

a reference oscillator having an oscillation frequency lower than the oscillation frequency of the voltage controlled oscillator to be measured;

a phase lock loop, operatively connected to the outputs from the voltage controlled oscillator and the reference oscillator, for controlling one of the voltage controlled oscillator and said reference oscillator so that the difference between the oscillation frequency of the voltage controlled oscillator and a value N (where N is an integer) times the oscillation frequency of said reference oscillator is a predetermined value;

a counter, operatively connected to said reference oscillator, for counting the oscillation frequency of the reference oscillator;

approximate frequency detecting means, operatively connected to the voltage controlled oscillator, for detecting an approximate oscillation frequency approximately corresponding to the control voltage for setting the oscillation frequency of the voltage controlled oscillator;

dividing means, operatively connected to said counter and said approximate frequency detecting means, for dividing the approximate oscillation frequency by the count value of said counter and for determining the value N from the result of the division; and

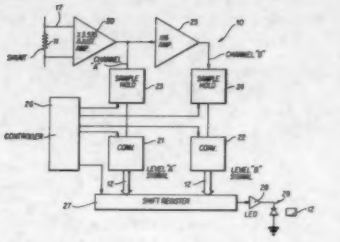
calculating means, operatively connected to said dividing means and said counter, for obtaining the oscillation frequency of the voltage controlled oscillator, said calculating means including means for multiplying the value N obtained from said dividing means by the count value of the counter.

4,374,359

SYSTEM AND METHOD OF SENSING CURRENT IN HIGH VOLTAGE TRANSMISSION LINES UTILIZING THE TRANSMISSION OF DIGITAL INFORMATION BY OPTICAL FIBERS

Gilles Missout, Quebec, Canada, assignor to IREQ—Institut de Recherche de l'Hydro-Quebec, Quebec, Canada

Filed Oct. 4, 1979, Ser. No. 82,223
Int. Cl.³ G01R 19/00, 15/04
U.S. Cl. 324—96 **17 Claims**



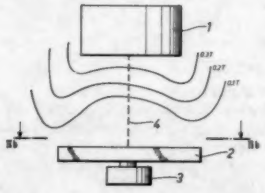
1. A system for sensing and measuring current on a high voltage transmission line comprising an input shunt element connected to said transmission line for sensing a current flowing therethrough, a transmitter circuit for transmitting a signal representative of said current passing through said shunt element, said transmitter having converter means for producing a composite output digital coded signal representative of the value of said measured current, a light transmitting output means for transmission of said coded signal on an optical fiber transmission line to a receiver circuit having decoding circuit means for decoding and reconstituting said coded signal to a usable form to determine said value of said measured current, said shunt element having a resistive conducting core with an internal chamber, said transmitter circuit being contained within said internal chamber to shield its circuitry from electric and magnetic fields produced by said current flowing through said conducting core around said transmitter circuit.

4,374,360

NMR DIAGNOSIS APPARATUS

Raimo E. Sepponen, Pitkänsillanranta 7-9 C 111, 00530 Helsinki 53, Finland

Filed May 29, 1980, Ser. No. 154,595
Int. Cl.³ G01N 27/00
U.S. Cl. 324—309 **9 Claims**



1. Nuclear magnetic resonance diagnosis apparatus for creating a magnetic field at the object of examination and having a transmitter for transmitting a high-frequency electro-magnetic radiation to the object under examination and a receiver for reception of the NMR signal emitted by the object irradiated in the magnetic field and transmission of said signal to means for processing and analyzing the signal, comprising first and second means for producing the magnetic field, said first means including a magnetic field generating means to produce an inhomogeneous magnetic field, and said second means includ-

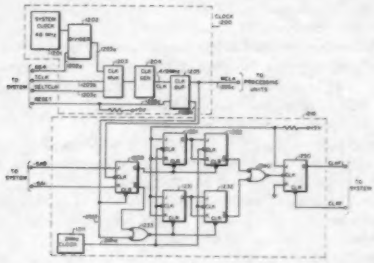
ing a mechanically movable member located in said magnetic field and a power means to move said member relative to said first member continuously, said movable member being constructed and arranged to modify the strength of said inhomogeneous magnetic field except for a sampling line (4) defining a concentrated elongated volume extending through the object and passing through a sampling point, and extending through said field whereby a constant field strength of a given intensity operable in NMR diagnosis is thereby created within a small, locally circumscribed region, which is accurately pinpointable.

4,374,361

CLOCK FAILURE MONITOR CIRCUIT EMPLOYING COUNTER PAIR TO INDICATE CLOCK FAILURE WITHIN TWO PULSES

James R. Holden, Chicago, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 29, 1980, Ser. No. 220,933
Int. Cl.³ H03K *13/32, 17/296*
U.S. Cl. 328—120 **8 Claims**



1. A pulse monitor circuit for use in a switching system, said pulse monitor comprising:

a first source of periodic pulses;

a second source of periodic pulses;

input storage means connected to said first pulse source, operated in response to each of a first group of alternately occurring pulses from said first pulse source to generate a first clear signal, said input storage means further operated in response to each of a second group of alternately occurring pulses from said first pulse source to generate a second clear signal;

a first counter circuit connected to said input storage means and said second pulse source, operated in response to an absence of said first clear signal to count pulses from said second pulse source;

a second counter circuit connected to said input storage means and said second pulse source, operated in response to an absence of said second clear signal to count pulses from said second pulse source; and

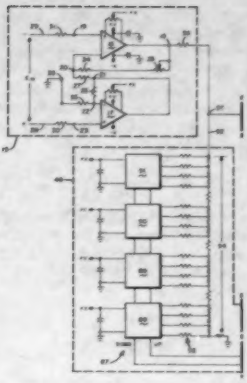
output storage means connected to said first and second counter circuits, operated in response to a predetermined count from said first or second counter circuits to generate a pulse failure signal.

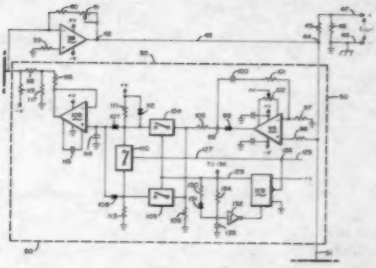
4,374,362

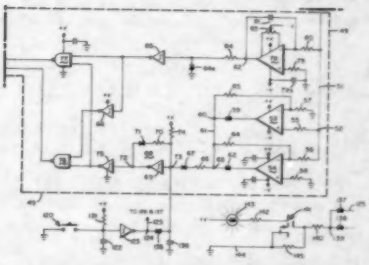
INSTRUMENT ZEROING CIRCUIT

George K. Sutherland, White Bear Lake, and Thomas J. Thielen, Minneapolis, both of Minn., assignors to Sys-Tec, Inc., New Brighton, Minn.

Filed Feb. 17, 1981, Ser. No. 235,151
Int. Cl.³ H03L *1/00*
U.S. Cl. 328—162 **4 Claims**







1. Electronic apparatus for removing a direct current bias level from a composite input signal of the type having a time varying component superimposed on said direct current bias level, comprising:

(a) input means for receiving said composite input signal;

(b) summing amplifier means having an input terminal and an output terminal, said input terminal being coupled to said input means and first and second negative feedback loops adapted to be selectively coupled from said output terminal of said summing amplifier means to said input terminal thereof;

(c) said first feedback loop including means for generating a digital number proportional to the deviation of said output signal of said summing amplifier means from a zero voltage reference value, means for converting said digital number to an analog voltage, and means coupling said analog voltage to said input terminal of said summing amplifier;

(d) said second negative feedback loop including means for sampling the output from said summing amplifier means and for holding a voltage value proportional to the deviation of said output signal from said summing amplifier from a predetermined reference for a predetermined time

and applying said voltage value to said input terminal of said summing amplifier; and

(e) control means for effectively connecting said first feedback loop in circuit with said summing amplifier for a first predetermined time and for subsequently disconnecting said first feedback loop while coupling said second feedback loop in circuit with said summing amplifier for a second predetermined time.

4,374,363

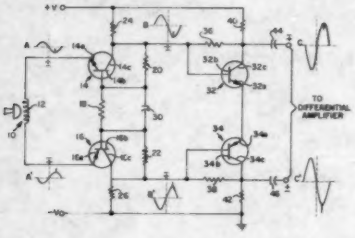
BALANCED IMPEDANCE COUPLER

Frank R. Previti, 550 Winchester Rd., Warminster, Pa. 18974

Filed Nov. 3, 1980, Ser. No. 203,197

Int. Cl.³ H03F *3/26*

U.S. Cl. 330—263 **6 Claims**



1. A circuit for coupling a two-terminal signal source of low impedance to a differential processor having a two-terminal input of higher impedance, comprising:

a first pair of complementary bipolar transistors arranged in a common-base configuration having a balanced input directly across the respective emitters of said transistors and a balanced output across the respective collectors.

4,374,364

DARLINGTON AMPLIFIER WITH EXCESS-CURRENT PROTECTION

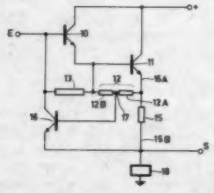
Jacques Hemery, Caen, and Bernard P. Roger, Carpiquet, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,125

Claims priority, application France, Oct. 22, 1979, 79 26168

Int. Cl.³ H02H *7/20*

U.S. Cl. 330—298 **12 Claims**



1. An amplifier device comprising a first transistor coupled directly to a second transistor, the arrangement so that said two transistors form a DARLINGTON amplifier, a first resistor connected in parallel with the base-emitter path of the second transistor, a second resistor connected in series in the emitter circuit of the second transistor and having a first end connected to said emitter of the second transistor and to one end of said first resistor, a third transistor having a collector connected to the base of the first transistor and an emitter connected to a second end of the second resistor, and means connecting the base of said third transistor to a tapping on said first resistor.

4,374,365

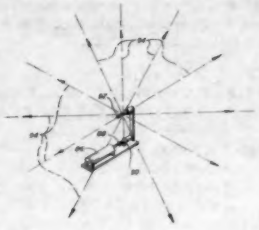
METHOD AND APPARATUS FOR PRODUCING 360 DEGREE RADIATION WITH STATIC COMPONENTS

James J. Kilcy, 2066 Partridge La., Binghamton, N.Y. 13903

Filed Jun. 11, 1979, Ser. No. 47,284

Int. Cl.³ H01S *3/03*

U.S. Cl. 372—92 **9 Claims**



1. A laser device comprising:

(a) an active gas medium within a resonant cavity bounded by two opposed spaced, concentric, cylindrical surfaces and two spaced, parallel, planar surfaces perpendicular to the common axis of said cylindrical surfaces;

(b) both of said cylindrical surfaces being highly reflective with respect to the wavelength of radiation produced by excitation of said active gas medium, one being more highly reflective than the other;

(c) said cylindrical surfaces being spaced by a radial distance substantially equal to an integral number of half wavelengths of said radiation; and

(d) pump means for applying an electrical field to said active gas medium to excite the latter to a level sufficient to produce lasing.

4,374,366

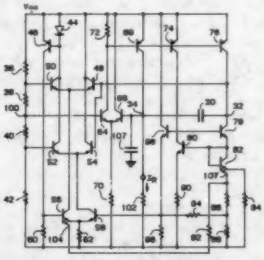
INTEGRATED HORIZONTAL OSCILLATOR EMPLOYING AN ON-CHIP CAPACITOR FOR USE IN A TELEVISION RECEIVER

Michael McGinn, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,606

Int. Cl.³ H03K *4/50*

U.S. Cl. 331—111 **9 Claims**



1. A horizontal oscillator for use in a television receiver, comprising:

a reference amplifier for generating a reference voltage;

a capacitor having a first terminal coupled to said reference voltage and a second terminal coupled to an output node;

first circuit means coupled to said reference amplifier for generating a referenced current;

second circuit means coupled to said output node for supplying a first current to said capacitor to charge said capaci-

tor in a first mode of operation and for pulling a second current from said capacitor in a second mode of operation, said first and second currents being substantially smaller than said reference current, said second circuit means including a first current mirror circuit coupled to said reference amplifier, to said first circuit means to said output node for supplying said first current, and a second variable gain current mirror circuit coupled to said output node for pulling said second current;

comparison means coupled to said output node for detecting when the voltage across said capacitor has increased to a first potential and has decreased to a second potential; and

third circuit means coupled to said second circuit means and to said comparison means for placing said second circuit means in said first mode when the voltage across said capacitor has decreased to said second potential and for placing said second circuit means in said second mode when the voltage across said capacitor has increased to said first potential.

4,374,367

NON-RECIPROCAL MICROWAVE-FREQUENCY DEVICE FOR HIGH-LEVEL OPERATION

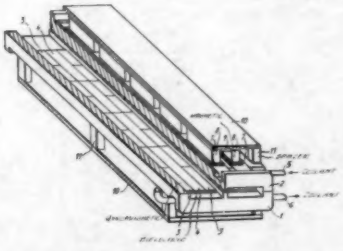
Gerard Forterre, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 9, 1980, Ser. No. 214,659

Claims priority, application France, Dec. 28, 1979, 79 31975

Int. Cl.³ H01P 1/19

U.S. Cl. 333—24.1 **3 Claims**



1. A non-reciprocal phase-shifter operating within the microwave-frequency range at a high mean power level and comprising:

at least one rectangular-section waveguide;

at least four longitudinal members of gyromagnetic material mounted within the waveguide and arranged symmetrically in pairs on each of the large walls of the waveguide;

a magnetic circuit for producing magnetizing fields in opposite directions parallel to the small walls of the waveguide within an internal space which includes said four members of gyromagnetic material, each member of gyromagnetic material being constituted by a first array of small parallel-epipedal gyromagnetic plates which have the same thickness as well as the same width and the longitudinal axes of which coincide, said gyromagnetic plates being bonded to the waveguide walls by an insulating silicon adhesive, two members of gyromagnetic material located on one and the same wall of the waveguide being placed on each side of at least one member of dielectric material centered on the mid-plane of the waveguide, said dielectric member being constituted by a second array of small parallelepipedal dielectric plates having the same width and a thickness equal to the thickness of said small gyromagnetic plates, the small dielectric plates being so arranged that their longitudinal axes coincide, said dielectric plates being bonded to the waveguide walls and to said gyromagnetic plates by an insulating silicone adhesive.

4,374,368

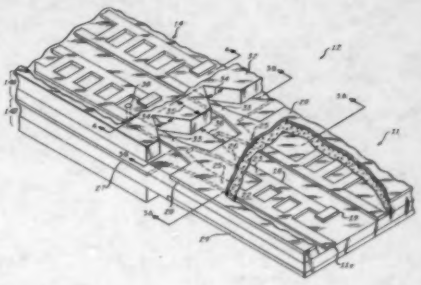
MULTILEVEL STRIPLINE TRANSITION

Raymond D. Viola, Oyster Bay, and Gerard L. Hanley, Melville, both of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,226

Int. Cl.³ H01P 5/12

U.S. Cl. 333—128 **2 Claims**



1. A stripline transformer comprising:

an input section having first and second ground planes and a multiplicity of inner conductors therebetween;

first and second stripline decks having a common ground plane therebetween each with a ground plane substantially parallel to said common ground plane positioned a predetermined distance therefrom and each with inner conductors positioned between said common ground plane and said substantially parallel ground plane;

first and second microstrip sections coupled between said input section and said first and second stripline decks respectively, each having conductors a predetermined distance from a ground plane extending from said common ground plane, said conductors of said first microstrip section coupled between said inner conductors of said first stripline deck and said first ground plane of said input section, said conductors of said second microstrip section coupled between said inner conductors of said second stripline deck and said second ground plane of said input section, and said ground plane extending from said common ground plane coupled to said inner conductors of said input section, thereby providing a transformation from one stripline to two striplines arranged in a double deck configuration.

4,374,369

ELECTROMAGNETIC INTERFERENCE ELIMINATION FILTER

Yukio Sakamoto; Tetsuo Tanaka; Masaaki Kuboto, and Masami Sugitani, all of Takefu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 16, 1980, Ser. No. 216,942

Claims priority, application Japan, Dec. 20, 1979, 54-177509[U]; Dec. 28, 1979, 54-184306[U]; Dec. 29, 1979, 54-181679[U]

Int. Cl.³ H03H 7/01, 1/00

U.S. Cl. 333—182 **4 Claims**

1. An electromagnetic interference supression filter, comprising:

(A) grounding means comprising a metal plate having a plurality of holes formed therein, said holes in said metal plate being disposed in first and second rows, each said hole of said first row being aligned with and adjacent to a respective said hole of said second row to form a hole pair;

(B) a plurality of filter units equal in number to the number of hole pairs, each of said filter units comprising:

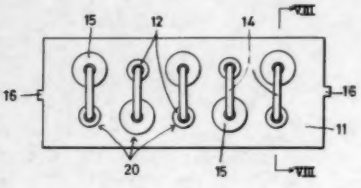
(1) a generally U-shaped penetration shaft having a central

part and having two legs extending from said central part generally parallel to each other;

(2) first and second capacitors each having a through hole formed therein, said through hole of each said capacitor receiving a respective portion of said penetration shaft; each said capacitor having a respective first electrode and a respective second electrode, said first electrode of each said capacitor being in electrical contact with the respective said portion of said penetration shaft which is received in said through hole of the respective said capacitor, said second electrode of each said capacitor being in electrical contact with said grounding means; and

(3) induction means disposed in electrical contact with said penetration shaft at a location intermediate said first and second capacitors;

(C) one said leg of said penetration shaft of each said filter



unit being received in a respective said hole in said first row and the other said leg of said penetration shaft of each said filter unit being received in the respective said adjacent hole of said second row;

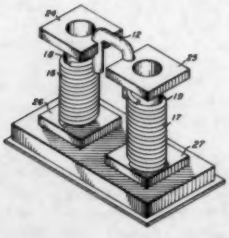
(D) said induction means having a through hole formed therein and receiving in its said through hole one said leg of said penetration shaft of the respective said filter unit; each said filter unit being so oriented that every second filter unit has its respective said induction means located on a penetration shaft leg that is received in a hole in said first row and the remaining said filter units have their respective induction means located on a penetration shaft leg that is received in a hole in said second row; said holes in said metal plate being defined at such locations that the respective said induction means of said plurality of filter units are sufficiently spaced from each other to prevent the occurrence of any substantial inductive coupling between them.

4,374,370

HELICAL RESONATOR FILTER

George N. Popovski, Weston, and Peter Vizmuller, Thornhill, both of Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1981, Ser. No. 248,753
Int. Cl.³ H01P *1/20, 7/00*
U.S. Cl. 333—202 **6 Claims**



1. A helical resonator filter comprising:

a first helical coil having first and second ends and being made of a conductive wire, said first end being electrically grounded;

a second helical coil having first and second ends and being made of a conductive wire, said first end being electrically grounded;

an electrical shielding chamber in which said first and said second helical coils are disposed adjacent each other, whereby said helical coils are electromagnetically coupled to each other so that said chamber and coils enable the filter to have a given bandwidth; and

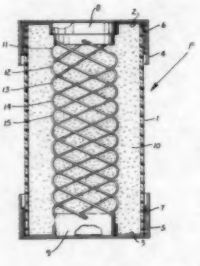
a coupling element comprised of an electrically conductive material and being placed substantially between the second end of said first helical coil and the second end of said second helical coil for modifying the bandwidth of the filter, said coupling element further being electrically isolated from said first and second coils and the electrical shielding chamber.

4,374,371

CADMIUM ELECTRIC FUSE

Vojislav Narancic, Montreal, Canada, assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Jan. 17, 1980, Ser. No. 112,733
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—159 **2 Claims**



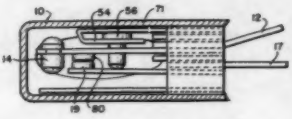
1. An electric general purpose current limiting fuse for use in circuits of at least 1000 volts, said fuse comprising a tubular housing of insulating material constructed to withstand the circuit recovery voltage following a circuit interruption by the fuse, a terminal cap mounted on each end of said tubular housing and constituting closure elements thereof, quartz sand of substantially spherical grains of random size formed is excess of 99% purity and disposed within and substantially filling said housing, a plurality of substantially homogeneous helical fusible elements formed of cadmium of 95% to 99.999% purity embedded in and supported by said quartz sand and having their ends connected with said terminal elements respectively to form a plurality of parallel conducting paths therebetween, said fusible elements being effective to melt and to interrupt currents many times the rated current of the fuse with a high degree of current limitation and each of said fusible elements being heated throughout substantially the entire length thereof to a temperature approximating the melting temperature thereof and substantially below the boiling temperature thereof by currents of low magnitude and slightly in excess of normal rated current, said fusible elements being arranged to melt in random sequence and arcs thereafter being established and extinguished in random sequence in said fusible elements via commutation action.

4,374,372

MODIFIED CONTACT STRIP MOUNTING MEANS FOR THERMOSTATIC SWITCHES

Omar R. Givler, North Canton, Ohio, assignor to Portage Electric Products, Inc., North Canton, Ohio

Filed Jun. 1, 1981, Ser. No. 269,312
Int. Cl.³ H01H 37/04
U.S. Cl. 337—380 8 Claims



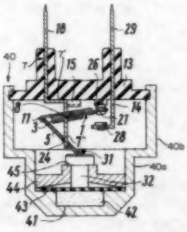
1. In a thermostatic switch having operating members including a bimetallic member, at least one contact arm, connector members, and contacts adapted to establish or disconnect an electrical circuit, all of the operating members being held within a case having an open end, said open end having a first dimension and a second dimension, the improvement which comprises an H-shaped cradle insulator block having side pieces shaped and sized so as to occupy, in a press fit, said first dimension of the open end of said case within which the operative members are inserted, and a cross piece connecting said side pieces, said cross piece being so sized, in combination with the thickness of said cross pieces, as to provide a press fit in said second dimension of the open end of said case, said cross piece providing an upper opening and a lower opening in said H-shaped cradle insulator block.

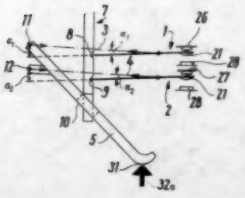
4,374,373

MULTIPLE CONTACTS, SNAP-ACTION, THERMAL SWITCH

Manfred Kurz, Ditzingen, Fed. Rep. of Germany, assignor to Behr-Thomson Dehnstoffregler GmbH, Kornwestheim, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,984
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007305
Int. Cl.³ H01H 37/46
U.S. Cl. 337—383 25 Claims





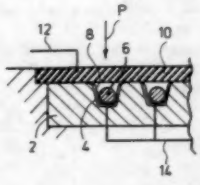
1. A snap-action thermal switch adapted to be operated by an expansion means the switch including a switch reed mounted so as to be pivotable about a pivot axis between at least two switching positions, a switch spring means for exerting force components in a longitudinal direction of a switch reed and in a pivoting direction of the switch reed, and an adjusting means adjustable by the expansion means, said switch spring means being arranged such that, after the expansion means attains a predetermined position, a force component of the switch spring means acting in a pivoting direction on the switch reed reverses direction with respect to the switch reed after the switch reed traverses a zero position, characterized in that at least one second switch reed is mounted so as to be pivotable about a second pivot axis between two switching positions, at least one second switch spring means exerts a first component on the second switch reed in a longitudinal direction and a force component in the pivoting direction of the second switch reed, the second spring means is arranged such that a force component of the second switch spring means acting in the pivoting direction of the second switch reed reverses direction with respect to the second switch reed in a second predetermined position of the expansion means, and in that the reed switches are supported at a mounting plate means so that the respective pivot axes are vertically offset.

4,374,374

ELECTRIC CONTACT DEVICE

Sven K. L. Goof, 236A Gl. Strandvej, DK-3050 Humlebaek, Denmark

Filed Apr. 15, 1981, Ser. No. 254,214
Claims priority, application Denmark, Apr. 17, 1980, 1635/80
Int. Cl.³ H01C 10/10
U.S. Cl. 338—114 8 Claims

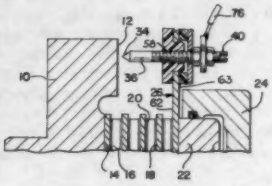


1. An electric contact device for operating and controlling electric units, such as an electric motor, said device comprising a base member, at least one electric conductor carried by and extending along a surface of said base member and defining a first contact member of the device, and an electrically conducting, resiliently deformable cover layer covering said conductor and defining a second contact member of the device, said first and second contact members being without electrical connection in a normal, passive state of the device, said electric conductor being recessed in a corresponding elongated indentation defined in said surface of the base member, said base member being relatively rigid in comparison with said cover layer so that said cover layer is resiliently deformable about confronting edges of said base member defining said indentation without deformation of said confronting edges, so as to be depressed into said indentation to establish electrical connection with said conductor therein, thereby closing a current flow path through the device.

4,374,375
PROBE MOUNT ASSEMBLY FOR BRAKE WEAR WARNING SYSTEMS

Aldo Allori, Brookfield; Ronald A. Koutsky, Lombard, and John A. Wilger, Chicago, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Apr. 13, 1981, Ser. No. 253,621
Int. Cl.³ B60R 25/10; G08B 21/00
U.S. Cl. 340—52 A 9 Claims



1. A probe mount assembly for supporting an adjustable contact probe of a pre-selected extension engageable with a ground member at a predetermined time to complete a warning signal electric circuit, the assembly comprising:

a tab plate supporting the assembly and movable with regard to said ground member;

said tab plate having an aperture;

said tab plate having inner and outer sides and said inner side facing the ground member;

bushing means threadably engageable with and holding said probe within said aperture and contiguous with said inner side;

a spacer slidably mounted on said bushing means and contiguous with said outer side;

said bushing means and said spacer electrically insulating said probe from said tab plate;

an electrical connector terminal detachably mounted on said probe and connected to said warning signal electrical circuit; and

locking means removably mounted on said probe for securing said assembly to said tab plate and facilitating an axial displacement of said probe;

said ground member being a disc brake housing, containing a set of frictionally engageable and alternatively spaced discs and friction plates;

said discs attached to and rotatable by a shaft;

said set being compressible by an associated brake piston to brake the rotational movement of said discs against said friction plates;

said probe being of a unitary construction and extending substantially outwardly from said bushing means and toward said ground member.

4,374,376
VEHICLE WARNING DEVICE

Harold E. Pillifant, Jr., 3522 W. Dunlap, #214, Phoenix, Ariz. 85021

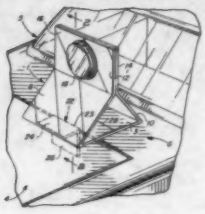
Filed Jul. 6, 1981, Ser. No. 280,458
Int. Cl.³ B60Q 1/26; G09F 15/00
U.S. Cl. 340—84 24 Claims

1. A warning device for use with a disabled vehicle to warn approaching motorists of the presence of the disabled vehicle, said warning device comprising in combination:

a. a base;

b. a panel supported by said base and extending upwardly therefrom, said panel having warning indicia thereon, said warning indicia including a light source; and

c. flap means secured to said base and extendible downwardly therefrom for insertion between the opened hood or trunk of the disabled vehicle and the body of the vehicle in order to anchor said base of said warning device to

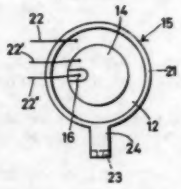


the disabled vehicle upon closure of the hood or trunk respectively.

4,374,377
PIEZOELECTRIC AUDIO TRANSDUCER

Nobuyuki Saito, and Hiroshi Saito, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 10, 1980, Ser. No. 215,037
Claims priority, application Japan, Dec. 12, 1979, 54-171999[U]; Dec. 13, 1979, 54-172588
Int. Cl.³ G08B 3/00; H01L 41/10
U.S. Cl. 340—384 E 5 Claims



1. A three-terminal audio transducer, wherein the outer periphery of a vibrator, which comprises a piezoelectric element placed on a metallic diaphragm, is securely supported on an acoustic casing, and wherein an elastic part is arranged between said casing and a fixing part of said audio transducer so as to be fixed to a mounting body, and wherein said elastic part has sufficient elasticity to enable said vibrator and casing and elastic part to vibrate in a well balanced fashion.

4,374,378
SCANNING SEISMIC INTRUSION DETECTION METHOD AND APPARATUS

Robert D. Lee, San Mateo, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

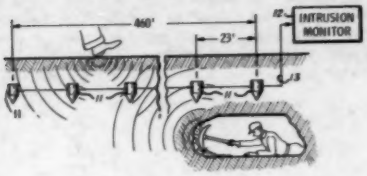
Filed Jan. 28, 1981, Ser. No. 229,231
Int. Cl.³ G08B 13/00
U.S. Cl. 340—566 2 Claims

1. In a method of intrusion detection, the steps of:

multiplexing into a receiver at a central location individual signals developed by vibrations sensed by individual ones of a plurality of seismic sensors in an array disposed in a monitored region within which intrusion by surface movement or tunneling is to be detected to obtain a scan of the seismic sensors in the array;

automatically stopping the multiplexing scan on a first individual sensor having a received vibration signal exceeding a predetermined threshold value to indicate the location of an intrusion; and

sequentially selecting the received signal developed on second and third seismic sensors in the vicinity of said first



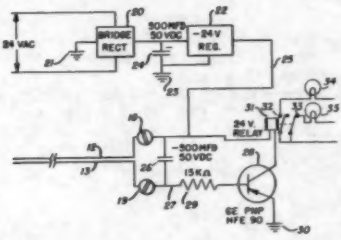
sensor to more precisely determine the location of the intrusion.

4,374,379

MOISTURE SENSING DEVICE FOR PIPES AND THE LIKE

Everett G. Dennison, Jr., 200 Glenview Rd., Canfield, Ohio 44406

Filed Aug. 25, 1980, Ser. No. 181,128
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—604 **4 Claims**



1. A device capable of detecting an extremely small drop of liquid associated with a leak from a pipe or the like comprising an alarm means, an elongated strip of insulating material having inner and outer faces, spaced longitudinally extending electrical conductors partially embedded in said strip, continuous portions of each of said conductors exposed on said outer face of said strip, said conductors being closely spaced to one another with a maximum spacing of about 3/64th of an inch therebetween so that extremely small particles of liquid can be detected, means on the inner face of said strip for mounting said strip to said pipe or the like, said electrical conductors connected with said alarm means, said alarm means arranged to initiate an alarm upon moisture bridging said electrical conductors.

4,374,380

AUTOMOTIVE ELECTRICAL NETWORK VOLTAGE REGULATION MONITORING CIRCUIT

Ulrich Giepen, Mundelsheim, and Friedhelm Meyer, Illingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,209
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903219
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—660 **4 Claims**

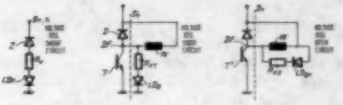
1. In an automotive-type self-contained on-board vehicular electrical network having a storage battery (13);

a generator (10) having a field winding (W) and supplying d-c output at a terminal (B+) for supply of power to a load bus (14) to charge the storage battery connected to the terminal (B+);

and a voltage regulator (12) having a power semiconductor (T, T') connected to the output (D+) of the generator and controlling power flow to the field winding (W) and having means (15) responsive to the voltage level on the power bus of the system controlling conduction of said power semiconductor in cycles to maintain an average predetermined current flow through the field winding in accordance with power requirements placed on the load bus,

and comprising,

a monitoring circuit to supervise proper operation of the voltage regulator power semiconductor (T, T') comprising



means sensing the electrical condition of the field winding (W) and including a light-emitting diode (LED), (LDr, LDg, LDg1) which, upon change of its illumination state, provides an output indication of the relation of the field winding with respect to the voltage thereacross, or with respect to a reference level;

wherein (FIG. 1) the electrical condition is the voltage across the load bus (14) and the sensing means comprises

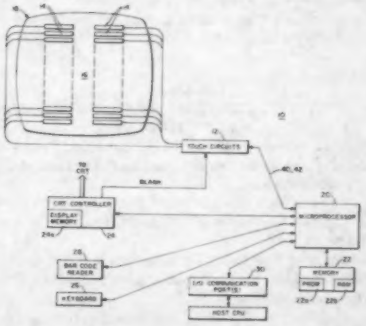
a Zener diode (Z) in series with said LED (LDr) connected across the load bus, said Zener diode breaking down and thus causing the LED to light when the voltage on the bus (14) exceeds a predetermined level due to short circuit of the voltage regulator semiconductor (T) and hence uncontrolled current flow through the field winding (W).

4,374,381

TOUCH TERMINAL WITH RELIABLE PAD SELECTION

Henry H. Ng, Chestnut Hill, and Frederick R. Schmidt, Marshfield, both of Mass., assignors to Interaction Systems, Inc., Newtonville, Mass.

Continuation-in-part of Ser. No. 170,056, Jul. 18, 1980. This application May 1, 1981, Ser. No. 259,614
Int. Cl.³ G06F *3/14;* **G09F** *9/32*
U.S. Cl. 340—711 **10 Claims**



1. In a display touch terminal having plural user-selectable, touch-responsive pad elements on a display screen for user communication with a data processing system, the improvement comprising

A. means in circuit with said pad elements for producing a sequence of pulse signals with pulse signal durations responsive to the touch-selection condition of any selected pad element,

B. pulse measuring means in circuit with said means for producing for measuring said pulse signal durations a selected multiple of times for any selected pad element,

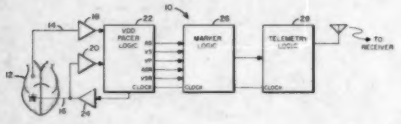
C. compare means in circuit with said measuring means for determining a difference in pulse signal duration between said multiple duration measures and a reference duration for said single pad element, and

D. means for identifying a single pad element as user selected in response to a selected comparison determination from at least some of said multiple duration measures.

4,374,382
MARKER CHANNEL TELEMETRY SYSTEM FOR A MEDICAL DEVICE

Harold T. Markowitz, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 16, 1981, Ser. No. 225,561
Int. Cl.³ A61N *1/30*; A61B *5/00*
U.S. Cl. 340—870.01 **6 Claims**



1. An implantable medical device of the type having means for detecting physiological events and having means for stimulating physiological activity and having a telemetry system for non-invasive communication with a remote receiver, said telemetry system comprising

means responsive to the detection of physiological events for producing a sensed event signal,

latch means responsive to said sensed event signal for storing a signal indicating the occurrence of said sensed event,

means responsive to the stimulation of physiological activity for producing a stimulated event signal,

latch means responsive to said stimulated event signal for storing a signal indicating the occurrence of said stimulated event,

encoding means for producing event identifying codes each representative of a said stored signal, and

means for serially transmitting said event identifying codes to said remote receiver.

4,374,383
CAPACITIVE TRANSDUCER FOR SENSING A HOME POSITION

Darryl R. Polk, Austin, and Errol R. Williams, Jr., Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,081
Int. Cl.³ G01R *27/26*; G08C *19/16*
U.S. Cl. 340—870.37 **8 Claims**

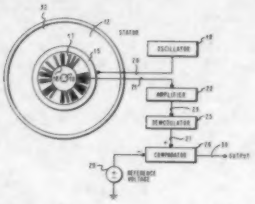
1. A capacitive transducer for sensing a home position of a first moving member with relation to a second adjacent member comprising:

a transmitter portion on one of said members having a planar surface and a first plurality of conductive elements arranged in a line on said surface,

a receiver portion on the other of said members having a planar surface and a second plurality of conductive elements on said receiver surface corresponding in number and arrangement to said first plurality of conductive elements, said second plurality of elements being adjacent to and spaced from said first line of elements,

means for applying an alternating electrical signal to said first plurality of elements, and

means connected to said second plurality of elements for sensing the capacitive effect induced in said second elements by said electrical signal,

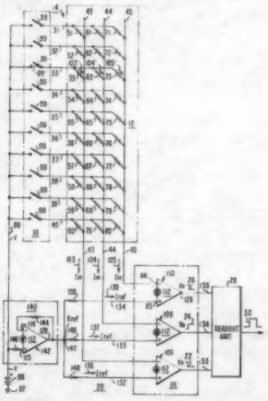


said first and second pluralities of elements being arranged in a non-repetitive pattern so that only a single home position in the relative motion between said two members will induce a single unique capacitive effect in said second plurality of elements.

4,374,384
MATRIX ENCODER FOR RESISTIVE SENSOR ARRAYS

Roger D. Moates, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 28, 1980, Ser. No. 182,295
Int. Cl.³ G08C *19/04*, *19/36*
U.S. Cl. 340—870.38 **31 Claims**



1. An encoder for producing electrical output signals in response to a condition to be monitored, comprising:

an encoding array of resistive sensors having variable resistances responsive to said condition to be monitored;

a matrix circuit including parallel inputs and parallel outputs connecting each of said resistive sensors to separate intersections of said matrix circuit;

sampling control means including normally high impedance switching means connected to said inputs of said matrix circuit, said normally high impedance switching means being selectively operable to sequentially energize separate ones of said inputs of said matrix circuit with a predetermined voltage to produce sensing currents in said variable resistances of each of said sensors connected to an energized one of said matrix circuit inputs; and

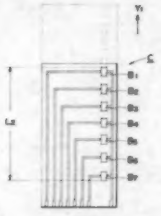
a detecting circuit connected with each of said parallel outputs of said matrix circuit, said detecting circuit maintaining minimum voltage differences between said parallel outputs for all values of said sensing currents and producing said electrical output signals in response to said sensing currents.

4,374,385

METHOD OF FORMING GRADATED IMAGES BY THERMAL PRINTER AND THERMAL HEAD FOR THERMAL PRINTERS

Osamu Yoshizaki, Fussa, and Masayuki Inui, Hachioji, both of, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,805
Claims priority, application Japan, Dec. 27, 1979, 54-171913; Dec. 27, 1979, 54-171914; Dec. 27, 1979, 54-185050[U]
Int. Cl.³ G01D *15/16, 15/10*
U.S. Cl. 346—1.1 **3 Claims**



1. In a method of forming a gradated image by using a thermal printer wherein a thermal head having a plurality of heating elements in aligned arrangement scans in one direction perpendicular to said aligned arrangement and the surface of thermal paper is fed in a secondary scanning direction intermittently and synchronously with the scanning movement of the thermal head, the method comprising the steps of: scanning with the thermal head while giving image element information proportional to image density to the heating elements to provide printing sections; feeding an amount of the thermal paper which is not greater than ½ of the length of said aligned arrangement of the heating elements whereby the thermal paper advances to a position where the sections formed between the preceding printing sections become subsequent printing sections; and again scanning with the thermal head while giving new image element information proportional to image density to such heating elements that are not opposed to the subsequent printing sections, and while giving to such heating elements that are opposed to the subsequent printing sections image element information proportional to image density which is the same as the already-printed image element information provided by an adjacent heating element.

4,374,386

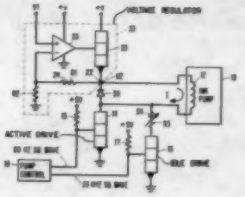
FORCE-TEMPERATURE STABILIZATION OF AN ELECTROMAGNETIC DEVICE

Carl R. Bildstein, Lafayette; Harry P. Heibein, Longmont, and Harlan P. Mathews, Louisville, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1981, Ser. No. 264,379
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **13 Claims**

10. In an ink supply system for an ink jet printer having an ink pump for pressurizing the ink so that ink jets out of a printer nozzle, a pump control for switching a pump drive between active and idle states when the printer is operative and inoperative respectively and a first driving means responsive to the pump control during the active state for electrically driving the pump at an operative frequency; the improvement comprising:

second driving means responsive to said pump control during the idle state for electrically driving said pump at an inoperative frequency outside the mechanical response capability of the pump;



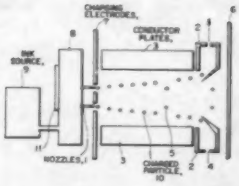
means for controlling an electrical power supplied to said pump by said second driving means whereby the power so supplied is substantially matched to an electrical power supplied said pump by said first driving means.

4,374,387

DEFLECTING DEVICE IN INK JET PRINTER

Tetsuo Iyoda, and Masatsugu Kikuchi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1981, Ser. No. 270,722
Claims priority, application Japan, Jul. 4, 1980, 55-90583
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **4 Claims**



1. An ink jet printer comprising: a plurality of nozzles, said nozzles being arranged in two parallel lines; a charging electrode disposed adjacent outlets of said nozzles for selectively charging ink jet particle pairs jetted by said nozzles; and a deflecting device including first and second parallel electrodes disposed between said nozzles and a recording medium, equal low voltage potentials being applied to both said parallel electrodes, uncharged ink particles jetted by said nozzles passing between said electrodes and wherein, a potential applied to said charging electrode for charging selected pairs of said jetted ink particles, said equal low voltage potentials applied to said parallel electrodes, a distance between said nozzles, and distances between each path of said uncharged jetted ink particles and a respective most closely adjacent one of said parallel electrodes being mutually set so that charged pairs of said jetted ink particles are repulsed by one another and attracted to a corresponding one of said parallel electrodes so as to move out of a printing particle area before reaching said recording medium.

4,374,388

METHOD AND AN ARRANGEMENT FOR DEPICTING A HALF-TONE IMAGE

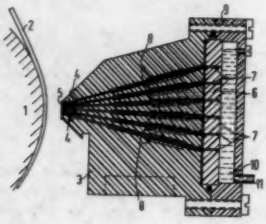
Joachim Heinzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 9, 1980, Ser. No. 195,595

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2943018

Int. Cl.³ G01D 15/18; H04N 1/40

U.S. Cl. 346—140 R 8 Claims



1. In a method of depicting a half-tone image in which the image is formed in grey steps extending between black and white and in which the image is generated from equisized image dots disposed in predetermined grid positions and of a number per unit area which determines the specific grey step, the improvement comprising the step of:

forming the image dots in grid positions which include three lines of orientation in which each grid position is surrounded by six directly adjacent grid positions and is equidistant from such grid positions.

4,374,389

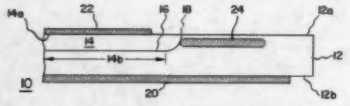
HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 913,026, Jun. 6, 1978, Pat. No. 4,242,690. This application Jun. 16, 1980, Ser. No. 159,813

Int. Cl.³ H01L 29/74

U.S. Cl. 357—13 49 Claims



1. In a semiconductor device including at least one p-n junction, a first region of semiconductor material of selected conductivity type including top and bottom surfaces of a predetermined length and further including a side surface, a second region of semiconductor material of conductivity type opposite that of the first region and extending downward from a portion of the top surface of the first region, said second region including upper and lower surfaces, said p-n junction being situated at the interface between the first and second regions, and further including a junction termination formed at the intersection of the junction with the upper surface of said second region, wherein the improvement comprises:

a junction extension region of semiconductor material of the same conductivity type as the second region and having a greater lateral extent than thickness, the thickness of said junction extension region being less than the thickness of said second region, said junction extension region being located proximate to the junction termination and oriented approximately parallel to the major plane of the junction, a substantial portion of the junction extension region being situated between the junction termination and the side surface of the first region so as to increase the avalanche breakdown voltage of said device.

4,374,390

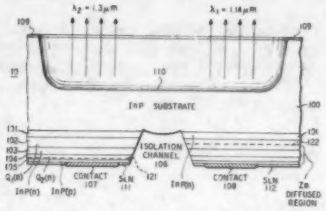
DUAL-WAVELENGTH LIGHT-EMITTING DIODE

Tien P. Lee, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 10, 1980, Ser. No. 185,666

Int. Cl.³ H01L 29/06, 33/00

U.S. Cl. 357—17 10 Claims



1. A planar light-emitting diode comprising

an n-type indium phosphide body,

a first electrical contact to said body, and

a plurality of epitaxial layers grown on said body, characterized by

a first quaternary layer having an initial n-type conductivity,

a p-type indium phosphide layer on said first layer and a first pn junction in said first layer,

said plurality of layers further includes a second quaternary layer initially having n-type conductivity,

said second layer being positioned between said body and said first layer,

said plurality of layers being physically separated, by means of an isolation channel, into at least two separate regions each including a single p-n junction,

one of said regions being diffused with a p-type dopant so as to form a second pn junction in said second quaternary layer, and

a second electrical contact to said p-type indium phosphide layer in each of said regions.

4,374,391

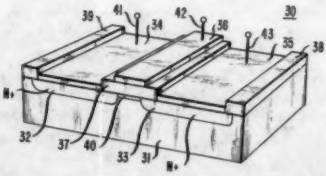
DEVICE FABRICATION PROCEDURE

Irfan Camlibel, Stirling; Shobha Singh, Summit, and LeGrand G. Van Uitert, Morristown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 24, 1980, Ser. No. 190,342

Int. Cl.³ C23C 15/00; H01L 31/00

U.S. Cl. 357—17 36 Claims



19. A device comprising a surface at least partially coated with a borosilicate glass layer, said layer fabricated by sputtering a borosilicate glass target material characterized in that the

borosilicate glass target material used in the sputtering procedure is prepared by a procedure comprising the steps of

a. mixing together a substance A consisting essentially of SiO_2 in which at least 90 weight percent of the SiO_2 has a particle size less than 10 microns with a substance B consisting essentially of B_2O_3 in which at least 90 weight percent of the B_2O_3 has a particle size less than 10 microns and

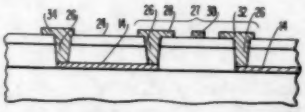
b. heat treating the resulting mixture at a temperature between 1500 and 2100 degrees C. for at least 6 hours.

4,374,392

MONOLITHIC INTEGRATED CIRCUIT INTERCONNECTION AND FABRICATION METHOD

Walter F. Reichert, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1980, Ser. No. 210,250
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23 **7 Claims**



1. A monolithic integrated circuit, comprising:

a substrate of III-V material having a surface;

an interconnection pattern disposed on the substrate surface;

an epitaxial layer disposed on the substrate surface and the interconnection pattern; and

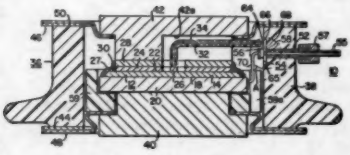
a plurality of circuit elements disposed on the epitaxial surface, each element having a portion which contacts the interconnection pattern.

4,374,393

LIGHT TRIGGERED THYRISTOR DEVICE

Koichi Kamahara, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 195,907
Claims priority, application Japan, Oct. 13, 1979, 54-133916
Int. Cl.³ H01L *27/14, 29/74, 23/16, 39/02*
U.S. Cl. 357—30 **3 Claims**



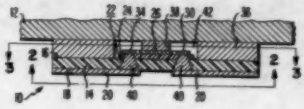
1. A light triggered thyristor device comprising a mean thyristor, an auxiliary thyristor capable of being triggered by a light signal incident on a light receptor area thereof, and an electrically insulating hermetically sealed cylinder case, said case having side walls forming a hole through which a fiber optics cable is introduced into said case, said main thyristor being supported in said case by a pressure contact of exterior anode and cathode electrodes, said auxiliary thyristor being fixed to said walls of said case with the light receptor area thereof placed in registry with an end portion of said fiber optics cable, anode electrodes of both of said thyristors being electrically interconnected, and a gate electrode of the main thyristor and a cathode electrode of the auxiliary thyristor being electrically interconnected.

4,374,394

MONOLITHIC INTEGRATED CIRCUIT

Raymond L. Camisa, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 1, 1980, Ser. No. 192,849
Int. Cl.³ H01L *23/34, 23/50*
U.S. Cl. 357—81 **9 Claims**



1. A monolithic integrated circuit, comprising:

a substrate having first and second opposing major surfaces;

a semiconductor device on the first major surface, a circuit film pattern on the second surface, and means for interconnecting the device to the film pattern;

a metallization layer on the first surface, said layer surrounding the device and having a thickness greater than the height of the device from the first surface; and

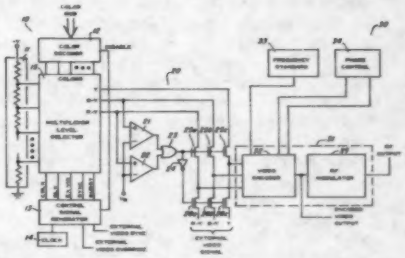
an electrode extension projecting from the device to a height substantially equal to the thickness of the metallization layer.

4,374,395

VIDEO SYSTEM WITH PICTURE INFORMATION AND LOGIC SIGNAL MULTIPLEXING

Carlo L. Herrmann, and Granville E. Ott, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1980, Ser. No. 219,806
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **14 Claims**



1. A luminance signal generator having a first output terminal, for generating at said first output terminal a line synchronization signal having a predetermined fixed first voltage during a first predetermined period of a repetitive video line interval and for generating at said first output terminal a brightness signal having a voltage in the range between a second voltage and a third voltage during a second predetermined period of said repetitive video line interval, said range between said second voltage and said third voltage extending to the limits of said brightness signal voltages and not including said first voltage; and

two color difference signal generators, each having a second output terminal and each responsive to an external video override signal, each for generating at said second output terminal a color difference signal having a voltage in said range between said second voltage and said third voltage during said second predetermined period, said range between said second voltage and said third voltage extending to the limits of said color difference signal voltages, and each for generating at said second output terminal an

external video enable signal having said first voltage when said external video override signal is received.

4,374,396

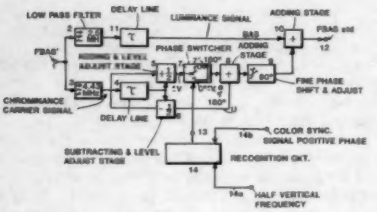
CHROMINANCE SUB-CARRIER MODIFIER FOR PAL-COLOR TELEVISION SIGNALS

Michael Hausdörfer, Mühltal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 33,536, Apr. 26, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,219

Int. Cl.³ H04N *9/50, 9/38, 5/78*

U.S. Cl. 358—24 **5 Claims**



1. A chrominance carrier modifier apparatus for PAL-color television signals to provide television signals ($FBAS_{std}$) in accordance with PAL-standards derived from applied signals (FBAS') lacking chrominance sub-carrier frequency phase alternation, particularly when derived from magnetic transducer apparatus in which tape transport is stopped to reproduce still pictures comprising

a PAL-signal splitter and delay circuit (**4,5,6**) in which the chrominance sub-carrier is added to, or subtracted from, respectively, a delayed chrominance sub-carrier signal which is time-delayed by a delay time of about 283.5 or 284 chrominance sub-carrier signal periods, to provide added and subtracted first Signals (U resp. V), respectively;

a controlled inverter (**7**) connected to receive that one of the first signals, which periodically changes its sign (±V);

means (**13,14**) connected to and controlling said controlled inverter (**7**) in accordance with a signal having half the vertical frequency to thereby control said controlled inverter (**7**) to provide inversion of said one of the first signals (±V) during each second field;

and an adding stage (**8**) which receives the alternatingly direct and inverted first signal (±V) from the output of the controlled inverter (**7**) and the other first signal (U) and providing a second combined chrominance sub-carrier signal at its output.

4,374,397

LIGHT VALVE DEVICES AND ELECTRONIC IMAGING/SCAN APPARATUS WITH LOCATIONALLY-INTERLACED OPTICAL ADDRESSING

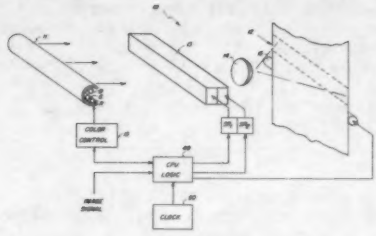
Jose M. Mir, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,975

Int. Cl.³ H04N *1/22*

U.S. Cl. 358—75 **9 Claims**

6. A light valve device for locationally-interlaced, optical addressing of an image exposure or scan station, said device comprising a linear light valve array adapted for optical alignment with a line of such station, said array having a plurality of location-address sectors that each include a plurality of discrete light valve pixel portions which are electrically addressable to control the passage of light, each light valve pixel portion being coupled for common electrical address, in an inter-sector group, with one light valve pixel portion of each of the other location-address sectors, but independently address-



able with respect to the other light valve pixel portions of its own location-address sector.

4,374,398

MULTIPLEXED TELEVISION AUDIO SIGNAL RECEIVER

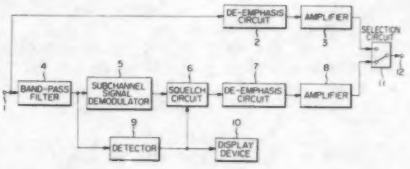
Akira Yamashita, Nagaokakyo, and Nagai Hiroyuki, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 8, 1981, Ser. No. 252,182

Claims priority, application Japan, Apr. 15, 1980, 55-49691

Int. Cl.³ H04N *5/60;* **H04B** *1/10*

U.S. Cl. 358—143 **3 Claims**



1. A multiplexed television audio signal receiver of the type capable of receiving by the inter-carrier system the television multiplexed audio signals comprising the main audio signal multiplexed with a second or third FM subchannel signal, characterized by the provision of

(a) a band-pass filter for extracting the FM subchannel signal,

(b) a clipper circuit for suppressing only the carrier level of the output from said band-pass filter,

(c) a detector for detecting the output from said clipper circuit so as to detect the noise level, and

(d) a squelch circuit responsive to the output from said detector for cutting off the demodulated subchannel signal.

4,374,399

INSERTION OF NON-SYNCHRONOUS DATA INTO VERTICAL INTERVAL

James W. Ensinger, Roselle, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 13, 1981, Ser. No. 292,453

Int. Cl.³ H04N *7/04*

U.S. Cl. 358—147 **16 Claims**

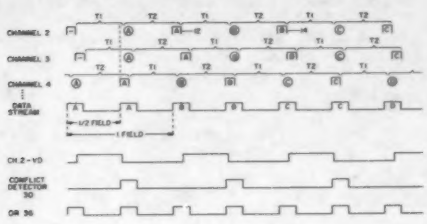
1. Apparatus for encoding a plurality of data packets into the vertical intervals of a received television signal comprising:

means for successively generating each of said data packets in the form of a pair of duplicate data packets at twice the field rate of a standard television signal;

storage means adapted for storing one of said data packets;

means responsive to said generating means and to said re-

ceived television signal for replacing the contents of said storage means with one of the duplicate data packets of each of said pairs whose generation is non-coincident in time with the occurrence of a vertical interval of said received television signal; and



means responsive to the occurrence of each vertical interval of said received television signal for inserting therein the current contents of said storage means.

4,374,400

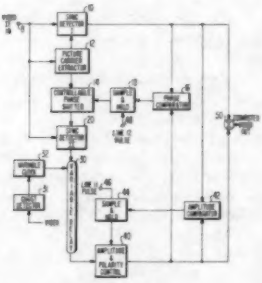
TELEVISION GHOST CANCELLATION SYSTEM WITH GHOST CARRIER PHASE COMPENSATION

David D. Holmes, Chesterfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,180

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—167 **6 Claims**



1. In a television receiver, including a source of desired intermediate frequency video signals including a picture carrier, said signals being subject to contamination by a ghost signal which includes a ghost signal picture carrier;

a picture carrier extractor circuit having an input responsive to said intermediate frequency video signals and an output at which a first reference signal substantially aligned in phase and frequency with the picture carrier of said video signals is produced; a first synchronous detector having a first input coupled to receive said intermediate frequency video signals including said ghost signal when present, a second input coupled to receive said first reference signal, and an output at which a first baseband video signal is produced; and a television signal ghost detector responsive to said first baseband video signal for determining the time interval between the occurrence of said video signals and their corresponding ghost signal components when a ghost signal is present; a television signal ghost cancellation system comprising:

a controllable phase shifter having a signal input coupled to receive said first reference signal, a control signal input, and an output at which a second reference signal is produced;

a second synchronous detector having a first input coupled to receive said intermediate frequency video signals, a second input coupled to receive said second reference signal, and an output at which a second baseband video signal is produced;

a variable delay line having an input coupled to the output of said second synchronous detector, and an output at which a delayed video signal is produced, and coupled to said ghost detector for delaying said second baseband video signal by an amount of time substantially equal to the time interval between the occurrence of said video signals and their corresponding ghost signal components when a ghost signal is present;

an amplitude and polarity control circuit having a signal input coupled to the output of said delay line, a control input, and a signal output for producing a pseudo-ghost signal;

amplitude comparison means having a first input coupled to the output of said first synchronous detector, a second input coupled to the output of said amplitude and polarity control circuit, and an output coupled to the control input of said amplitude and polarity control circuit for causing said pseudo-ghost signal to be substantially equal in amplitude and opposite in polarity to said ghost signal of said first baseband video signal;

phase comparison means having a first input coupled to the output of said first synchronous detector, a second input coupled to the output of said amplitude and polarity control circuit, and an output coupled to the control input of said controllable phase shifter for causing said phase shifter to shift the phase of said first reference signal by an amount substantially equal to the phase difference between said picture carrier of said desired intermediate frequency video signals and said picture carrier of said ghost signal; and

means coupled to the outputs of said first synchronous detector and said amplitude and polarity control circuit for combining said first baseband video signal with said pseudo-ghost signal to produce a deghosted video signal.

4,374,401

TAPE PLAYER

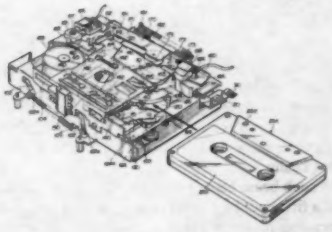
Kazuki Takai, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1979, Ser. No. 86,054

Claims priority, application Japan, Oct. 20, 1978, 53-143326[U]; Oct. 26, 1978, 53-146436[U]; Mar. 12, 1979, 54-27639

Int. Cl.³ G11B *15/18, 23/10*

U.S. Cl. 360—96.5 **7 Claims**



1. A tape player which comprises: magnetic recording/reproducing means for recording signals on or reproducing signals recorded on the tape in a cassette in a recording/reproducing position; a cassette-receiving frame; slide means adapted to slide rearwardly on said frame under the force of a tape cassette pushed rearwardly thereinto; lift means for effecting the placement of means adjacent to said cassette to effect a tape feeding operation in a raised or lowered position thereof and is initially located in the other position; engaging means

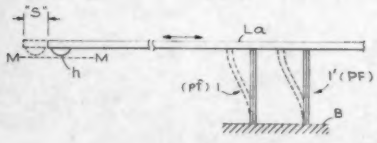
provided on said lift means and engaged by said slide means upon rearward movement thereof in said frame so that the lift means is moved from its initial lowered or raised position to the other of said positions as said slide means is moved to the rear of said frame; lock means having a lock part which locks said lift means in the latter position and said slide means in a rearwardmost position when the slide means has been moved to its rearwardmost position where the cassette is in a position preparatory to a recording/reproducing operation; attractable means connected to said lock means; electromagnetic means; switch means provided for energizing said electromagnetic means in response to the sliding of said slide means toward said rearwardmost position; and said attractable means being attracted by said electromagnetic means when said electromagnetic means is energized to complete the movement of said lock means to its final locking position, the attracting force of said electromagnetic means aiding in the completion of the movement of said lock means to its final locking position and the movement of said lift means and slide means to their locked positions during a cassette insertion operation, to reduce the force necessary to move said cassette into a position preparatory for a recording/reproducing operation.

4,374,402

PIEZOELECTRIC TRANSDUCER MOUNTING STRUCTURE AND ASSOCIATED TECHNIQUES

Norman S. Blessom; Herbert U. Ragle, both of Thousand Oaks, and Dean DeMoss, Camarillo, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 27, 1980, Ser. No. 163,468
Int. Cl.³ G11B *5/48, 5/56, 21/24*
U.S. Cl. 360—104 **9 Claims**



1. An actuator unit mounted on prescribed actuator means including a transducer means at the free end thereof adapted to reciprocate elongate load means along a prescribed rectilinear path, being supported on at least two parallel flexure means, each flexure means comprising an elongate, composite multi-element beam;

each such beam being comprised of a center section flanked, at a first end, by a first bending section and associated first bending means adapted to bend this first section in a first direction relatively along said path; and

also flanked at a second, opposite, end by a second bending section and associated second bending means adapted to bend this second section in a second direction, opposite said first direction,

said first and second bending means being adapted to each execute a compound "s-bend",

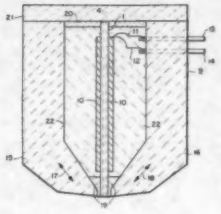
whereby said elongate load means is so thrust along said rectilinear path as to minimize azimuth dislocation of the transducer means.

4,374,403

MAGNETIC RECORDING AND REPRODUCING SYSTEM

Mitsuaki Oshima, Kyoto; Yutaka Neichi, Nara; Atsushi Iga, Takatsuki, and Ryoichi Wada, Habikino, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1980, Ser. No. 162,611
Claims priority, application Japan, Jun. 27, 1979, 54-82153; Aug. 24, 1979, 54-108291
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—113 **24 Claims**



1. A magnetic recording/reproducing system comprising:

(a) a magnetic switching device adapted to exhibit abrupt magnetic switching phenomena in accordance with the increase in a magnetic field and composed of portions made of a magnetic material and having relatively high and relatively low coercive forces;

(b) a magnetic head accommodating said magnetic switching element;

(c) magnetic detecting means disposed within such a range as can receive the magnetic influences from said magnetic switching device;

(d) magnetizing means disposed within such a range as can receive the magnetic influences from said magnetic switching device; and

(e) magnetizing signal generating means rendered operative to feed a magnetizing signal to said magnetizing means in response to the signal from said magnetic detecting means,

whereby the magnetic switching means, which is disposed in said magnetic head for exhibiting the abrupt magnetic switching phenomena in accordance with the increase in the magnetic field, is magnetized by said magnetizing means prior to being driven by said magnetizing signal generating means so that the magnetic switching phenomena may be established in said magnetic switching device in response to the magnetizing signal, said magnetizing signal recorded in a magnetic recording medium facing said magnetic head, and may be extracted as a voltage signal by said magnetic detecting means.

4,374,404

NON-ABRASIVE MAGNETIC HEAD CLEANING SYSTEM

C. Paul Davis, Woodland Hills, Calif., assignor to Innovative Computer Products Corp., Tarzana, Calif.

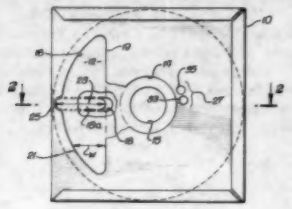
Filed Aug. 25, 1980, Ser. No. 180,963
Int. Cl.³ G11B *5/41, 23/02, 25/04*
U.S. Cl. 360—128 **10 Claims**

1. A method for cleaning magnetic heads in a disk system employing a jacket that rotatably supports a cleaning disk within its interior and has a first opening therein and has a perforated portion in opposition to the opening; the steps comprising:

removing the perforated portion to form a second opening;

saturating a portion of said cleaning disk with a cleaning solution via said first opening;

bringing said cleaning disk into contact with two magnetic heads to be cleaned; and



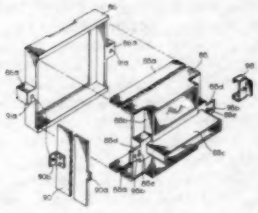
rotating said cleaning disk to alternately contact said head with a wet portion and a dry portion of said cleaning disk.

4,374,405

INSULATING-ISOLATING BARRIER SYSTEM FOR ELECTRICAL DISTRIBUTION EQUIPMENT BUSWORK

William F. Olashaw, Plainville, and James H. Postlethwait, Weatogue, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 10, 1980, Ser. No. 214,852
Int. Cl.³ H02B *1/14, 1/20*
U.S. Cl. 361—355 **5 Claims**



1. An insulating-isolating barrier system for electrical switchboards and the like, said system comprising, in combination:

a plurality of modular, insulative bases assembled in end-to-end vertical relation to a switchboard frame, said bases including a plurality of side-by-side channels in which switchboard riser busbars are individually supported;

an insulative barrier panel secured to each said base to close off said channels and isolate said riser busbars therein, at least one of said panels having apertures therein individually accessing said riser busbars for electrical connection with separate power connectors, said power connectors making bus joints between separate runs of horizontal busbars and said riser busbars;

separate pairs of elongated, insulative barrier members clamped in semi-embracing relation with said horizontal busbar runs extending between said bus joints; and

a joint enclosure for each said bus joint, said enclosure including

an insulative collar embracing said power connector; and

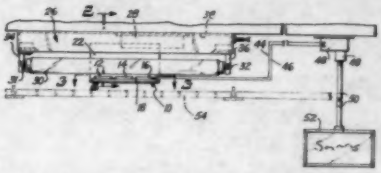
a removable, insulative cover mating with said collar to envelop said bus joint thereat, each said bus joint enclosure cover includes a frontal wall and integral therewith separate upper and lower substantially rectangular skirts disposed in lapped relation with said collar.

4,374,406

LIGHTWEIGHT ATTACHMENT FOR SOLAR CELL ARRAY NEXT TO A FLUORESCENT TUBE

James Hepp, 5 Fairview La., Glen Cove, N.Y. 11542

Filed Jul. 10, 1981, Ser. No. 282,186
Int. Cl.³ F21V *33/00*; G09F *11/02*
U.S. Cl. 362—253 **7 Claims**



1. A light fixture including a lightweight attachment positioning a solar cell array next to a fluorescent tube, comprising:

a ferromagnetic housing holding a fluorescent tube and a ballast;

a lightweight thermoplastic horizontal support;

a plurality of solar cells in side by side array on said support which are connected to each other in series by a pair of conductors, one of which is connected to a ground on said support;

a holding means structurally connected to said support and fastened to said housing to hold said array of solar cells on said support close to the tube and in fixed relation to the fixture in which said tube is placed:

spacing means which space said support in adjacent spacing to said fluorescent tube; whereby

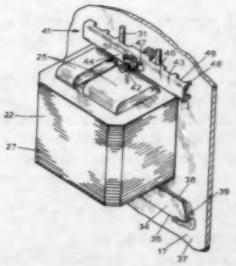
said conductors connecting said plurality of solar cells in series provide a dc current which is due to the radiation impinging upon said array from said fluorescent tube to constitute a power package furnishing dc current as long as said tube is lit.

4,374,407

BALLAST MOUNTING MEANS

Jim L. Drost, and Myron K. Gordin, both of Oskaloosa, Iowa, assignors to Muscatine Lighting Mfg. Co., Inc., Muscatine, Iowa

Filed Dec. 23, 1980, Ser. No. 219,540
Int. Cl.³ F21S *3/02*
U.S. Cl. 362—432 **5 Claims**



1. Means for mounting a ballast within a housing having a flat side wall and wherein the ballast is formed adjacent one side surface thereof with a pair of laterally spaced openings extended therethrough in a substantially parallel relation with said side surface, comprising:

(a) a pair of linear mounting rods corresponding to and extended through said openings having end sections projected outwardly from opposite ends of a corresponding opening,

(b) means on said container side wall for receiving in supported positions therein a first pair of adjacent ones of said end sections, and

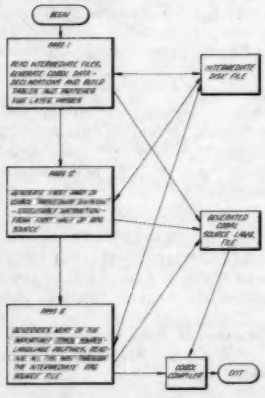
(c) clamping means secured to and projected inwardly of said side wall for engaging and moving the second pair of adjacent ones of said end sections toward said side wall whereby the rods are flexed to positions wherein the ballast is rigidly clamped against said side wall.

4,374,408

MULTI-PASS SYSTEM AND METHOD FOR SOURCE TO SOURCE CODE TRANSLATION

Stephen W. Bowles, and George E. Bethke, Jr., both of Goleta, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 16, 1971, Ser. No. 153,767
Int. Cl.[3] G06F 9/00, 15/38
U.S. Cl. 364—200 19 Claims


BEGIN
PASS I
READ INTERMEDIATE FILES, GENERATE COBOL DATA-DECLARATIONS AND BUILD TABLES THAT PERTAIN FOR LATER PASSES
INTERMEDIATE DISK FILE
PASS II
GENERATE FIRST PART OF COBOL "PROCEDURE DIVISION" -- CONSTANT INFORMATION -- FROM FIRST HALF OF SPEC SOURCE
RELOCATED COBOL SOURCE LANG. FILE
PASS III
GENERATE REST OF THE "PROCEDURE DIVISION" STATEMENTS IN COBOL, READING THE INTERMEDIATE SPEC SOURCE FILE
COBOL COMPILER
EXIT

9. In a data processing apparatus responsive to its particular machine language, the method for the translation of a routine from a first higher level program language to a second higher level program language, compiling said routine from said second higher level language into said particular machine language, and activating said apparatus to execute said particular machine language routine, said first higher level language implying a general algorithm characteristic of said first program language and said second higher level language being COBOL, said method comprising:

receiving a first plurality of sets of signals representing a routine in said first language;

generating, each time, in response to the receipt of said received first plurality of sets of signals, a second plurality of sets of signals including sets of signals representing said general algorithm as required by said first plurality of sets of signals;

receiving said second plurality of sets of signals and generating, in response thereto, a third plurality of sets of signals representing said routine in said particular machine language code; and

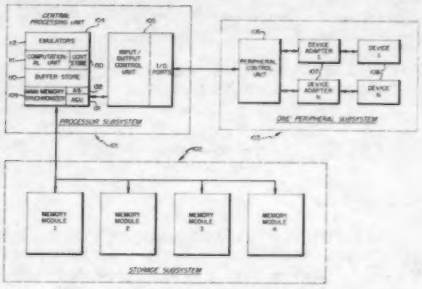
executing said routine in response to said third plurality of sets of signals in said apparatus.

4,374,409

METHOD OF AND SYSTEM USING P AND V INSTRUCTIONS ON SEMAPHORES FOR TRANSFERRING DATA AMONG PROCESSES IN A MULTIPROCESSING SYSTEM

Jacques Bienvenu, Paris; Claude Carre, La Varenne-St-Hilaire; Duc L. Tuong, and Henri Verdier, both of Paris, all of France, assignors to Compagnie Honeywell Bull, Paris, France

Continuation of Ser. No. 529,017, Dec. 2, 1974, abandoned. This application Nov. 3, 1978, Ser. No. 957,442
Claims priority, application France, Nov. 30, 1973, 73.42697
Int. Cl.[3] G06F 9/46
U.S. Cl. 364—200 16 Claims



1. In a multiprocessing data processing system wherein a data element is held in a memory member of said system, said data element having a tally field representing the number of times a particular kind of event has occurred, and wherein said data processing system during the execution of a process executes instructions of a particular class, a system for transferring data between processes comprising:

retrieving means controlled by one of said instructions for retrieving said data element from said memory member;

testing means for testing the tally field of said data element retrieved from said memory member to determine the number of times the particular event has occurred and for generating a first signal when the number represented by said tally field is greater than a predetermined value and for generating a second signal when said number is not greater than said predetermined value;

transfer means responsive to said first signal and controlled by an instruction executed during execution of said process for initiating selectively the transfer of data from said process to an area in said memory member of said system associated with said data element and the transfer of data previously stored in the area from the area to said process to establish data transfer between processes; and

changing means further responsive to said first signal and controlled by said instruction for updating said tally field following said transfer of data by changing said tally field to represent a different number.

4,374,410

DATA PROCESSING SYSTEM

Toshihiro Sakai, Kawasaki, and Tetsuji Kuhara, Matsudo, both of Japan, assignors to Fujitsu Limited, Kawasaki and USAC Electronic Industrial Co., Ltd., Ishikawa, both of, Japan

Continuation-in-part of Ser. No. 949,115, Oct. 16, 1978, abandoned. This application Aug. 8, 1979, Ser. No. 64,725
Claims priority, application Japan, Oct. 8, 1977, 52-121154
Int. Cl.[3] G06F 9/36
U.S. Cl. 364—200 7 Claims

6. A data processing system, comprising:

a central processing unit having a logical address mode and a real address mode and having an address register for storing a logical address or a real address in dependence

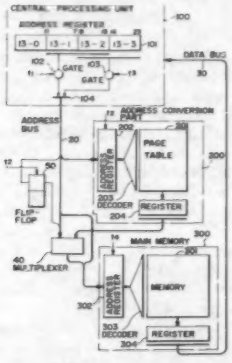
upon whether said central processing unit is in the logical address mode or the real address mode, said address register having a number of bit positions greater than N but less than 2 N (where N is an integer), said bit positions including a block of N high-order bits and a block of N low-order bits;

means for setting a page number portion of the logical address in a predetermined number, smaller than N, of the bits of said block of high-order N bits of the address register of the central processing unit when said central processing unit is in the logical address modes;

means for setting an address in page portion of the logical address in the remaining bit positions of said address register when said central processing unit is in the logical address mode;

means for setting a real address in said block of low-order N bits and in a predetermined number of the bits of said block of high-order N bits of the address register when said central processing unit is in the real address mode;

a main memory;



an N-bit address bus operatively connected to the central processing unit and the main memory;

sending means for sending the content of the address register out on the address bus in accordance with said block of high-order N bits of the address register being sent out first and said block of low-order N bits of the address register being sent out second, said sending means including means for sending the N bits so that said block of high-order N bits is overlapping with some of the bits in said block of low-order N bits, said sending means sending predetermined ones of said 2 N bits twice; and

address conversion means, operatively connected to the N bit address bus and the main memory, for converting said block of high-order N bits into a real page number in the main memory when said central processing unit is in the logical address mode, so that after said block of high-order N bits and said block of low-order N bits have been sent by said sending means an address for accessing said main memory is provided whether said central processing unit is in the real address mode or the logical address mode.

4,374,411

RELOCATABLE READ ONLY MEMORY

Dale A. Heatherington, Decatur, Ga., assignor to Hayes Microcomputer Products, Inc., Atlanta, Ga.

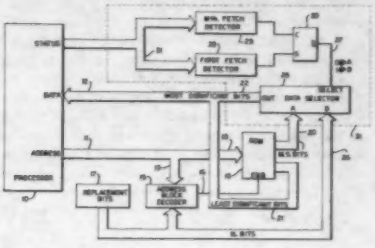
Filed Feb. 14, 1980, Ser. No. 121,450

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **6 Claims**

1. In a read only memory, adapted to be used with an L-bit byte, byte oriented processor, said processor being characterized by a data bus for at least presenting outputs from said memory to an address register in said processor, by an instruction set including memory reference instructions of M bytes requiring M fetches to memory wherein the Mth fetched byte of each of said memory reference instructions is a most significant byte, L and M being positive integers, said processor providing predetermined status signals, the improvement comprising:

location means for providing N replacement address bits,



N being an integer greater than zero and less than or equal to a L;

means responsive to said status signal for providing a most significant byte signal in response to an Mth fetch of a said memory reference instruction; and

data selector means for providing said N replacement bits to lines of said data bus in response to said most significant byte signal.

4,374,412

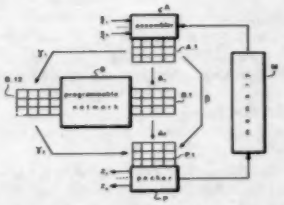
CIRCULATING PAGE LOOSE SYSTEM

Mario R. Schaffner, 3455 Table Mesa Dr., Apt. 228K, Boulder, Colo. 80303

Continuation of Ser. No. 573,211, Apr. 30, 1975, abandoned, which is a continuation of Ser. No. 328,526, Feb. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 184,598, Sep. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 779,824, Nov. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 640,180, May 22, 1967, abandoned, which is a continuation-in-part of Ser. No. 533,741, Feb. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 458,692, May 25, 1965, abandoned. This application May 7, 1980, Ser. No. 147,671

Int. Cl.³ G06F *15/06, 15/347*

U.S. Cl. 364—200 **12 Claims**



1. A programmable network for simultaneously processing sets of variables, comprising:

a plurality of registers X for holding page variables x_i;

a plurality of registers X' for holding auxiliary variables x'_i;

a plurality of registers U for holding input data u_i;

a plurality of registers W for holding program words $w_{j,i}$;

decoding means having an input receiving said program words $w_{j,i}$ and providing a plurality of outputs having control signals thereon;

control lines connected with said plurality of outputs of said decoding means for carrying control signals therefrom;

a plurality of operational means capable of performing arithmetic and logical functions, each said operational means having function-control inputs connected to said control lines, an output connected to the input of one of said registers X and X' to supply resulting data thereto, and inputs multiplexed to the outputs of said registers X, X', and U with said multiplexing being controlled by said control signals carried by said control lines; and

timing means, responsive to said control signals carried by said control lines, for establishing a cycle of operation by clocking said resulting data into said registers X and X', with the termination of each said cycle causing a new program word $w_{j,i}$ to be fed to said input of said decoding means whereby, for each said cycle, new values are simultaneously produced and stored in said registers X and X' as a function of the previous values in said registers X and X', of the values in said registers U, and of the content of program words $w_{j,i}$ fed to said input of said decoding means.

4,374,413

ARBITRATION CONTROLLER PROVIDING FOR ACCESS OF A COMMON RESOURCE BY A PLURALITY OF CENTRAL PROCESSING UNITS

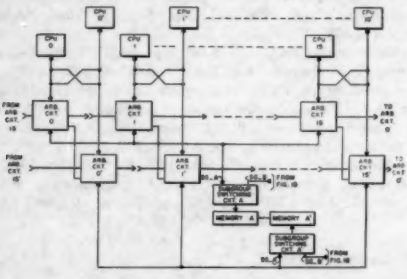
Joseph A. Comfort; Thomas J. Perry, and Michel Loos, all of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 26, 1980, Ser. No. 163,045

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.[3] **G06F** *13/00, 15/16*

U.S. Cl. 364—200 **9 Claims**



1. An arbitration controller providing for equal priority sharing of a common resource by a plurality of CPUs, said arbitration controller comprising:

a common bus including first and second portions;

switching means operated to provide alternate first and second selection signals;

first and second arbitration groups, each of said groups including:

means for initialization providing a first signal;

a plurality of arbitration circuits including a first, at least one successive and a last arbitration circuit;

said means for initialization connected to at least one of said arbitration circuits;

a plurality of CPU buses, each connected between a particular CPU and said resource via a particular arbitration circuit on a one for one basis, each CPU bus including a control portion and an address/data portion;

said common bus connected between each of said CPUs and said resource via said particular arbitration circuit for the transmission of information between said resource and any of said plurality of CPUs via said address/data portion of said CPU bus;

bus means for connecting each said common bus to each of said plurality of CPU buses in a tri-state fashion;

a plurality of circuit connections including a circuit connection between each arbitration circuit and each successive arbitration circuit, said last arbitration circuit connected to said first arbitration circuit, thereby forming a completed ring connection for propagating said first signal from one arbitration circuit to another arbitration circuit in a circular fashion;

each arbitration circuit operated in response to said first signal and to a common bus request signal from its corresponding CPU to produce a second signal for allowing said corresponding one of said plurality of CPUs access to said resource via said common bus;

each said arbitration circuit including:

first gating means operated to propagate said first signal along said ring connection at a relatively high rate of speed;

latching means operated in response to said common bus request signal of said corresponding CPU to produce said second signal for allowing said CPU to access said resource via said common and CPU buses;

second gating means operated in response to said operated latching means and in response to said propagated first signal to propagate a third signal from each arbitration circuit to each successive arbitration circuit;

said first signal propagating through each of said arbitration circuits in said ring connection to successively enable said CPU access to said resource via said common bus, while said third signal permitting said successive arbitration circuits to establish priority for subsequent access of said resource simultaneously with a present access of said resource; and

said switching means connected between said first and said second portions of said common bus and said resource whereby said first selection signal operates to enable access to said resource from said CPUs of said first portion of said common bus via said corresponding arbitration circuits and said first selection signal operates to inhibit said access from said CPUs of said second portion to said common bus and alternately said second selection signal operates to enable said access from said CPUs of said second portion of said common bus via said corresponding arbitration circuits and said second selection signal operates to inhibit access from said CPUs of said first portion to said common bus.

4,374,414

ARBITRATION CONTROLLER PROVIDING FOR ACCESS OF A COMMON RESOURCE BY A DUPLEX PLURALITY OF CENTRAL PROCESSING UNITS

Joseph A. Comfort; Thomas J. Perry, and Michel Loos, all of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 26, 1980, Ser. No. 163,046

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.[3] **G06F** *13/00, 15/16*

U.S. Cl. 364—200 **14 Claims**

1. An arbitration controller providing for equal priority sharing of duplicate copy resources by active ones of a plurality of duplicate pairs of CPUs, said arbitration controller comprising:

first and second common buses, each bus including first and second portions;

first and second switching means operated to provide alternate first and second selection signals;

first and second arbitration groups, each of said groups including:

first and second means for initialization, each providing a first signal;

corresponding first and second pluralities of arbitration

circuits, each plurality including a first, at least one successive and a last arbitration circuit;

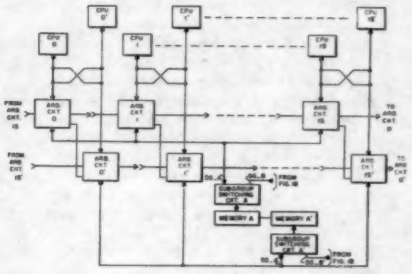
each of said means for initialization connected to at least one of said corresponding plurality of arbitration circuits;

first and second pluralities of CPU buses each bus of each plurality connected between a particular CPU and said resources via a particular arbitration circuit on a one for one basis, each CPU bus including a control portion and an address/data portion;

each of said buses of said first plurality connected to a particular one of said buses of said second plurality and each of said buses of said second plurality connected to a particular one of said buses of said first plurality;

said first and second common buses, each common bus connected between said corresponding plurality of CPUs and a particular one of said duplicate copies of said resource via said corresponding arbitration circuits for the parallel transmission of information between said duplicate common resources and any said active one of said plurality of CPUs via said address/data portion of said corresponding CPU bus;

first and second pluralities of circuit connections, each plurality including a circuit connection between each first arbitration circuit and each successive arbitration circuit, each of said last arbitration circuits connected to said first arbitration circuit of its respective plurality, thereby forming first and second completed ring connections, each of said ring connections propagating a respective one of said first signals synchronously;



one arbitration circuit of each plurality simultaneously operated in response to its respective first signal and to a common bus request signal from said active CPU, each arbitration circuit producing a second signal for allowing said active CPU to access each of said duplicate copy resources simultaneously via said first and said second common buses respectively;

each of said first signals propagating through each of said corresponding plurality of arbitration circuits to successively enable said active ones of said CPUs to access said duplicate copies of said resource; and

said first switching means connected between said first and second portions of said first common bus and one copy of said resource, said second switching means connected between said first and second portions of said second common bus and said duplicate copy of said resource, whereby said first and second switching means each operates in response to said first selection signal to enable access to a copy of said duplicate copy resources from said arbitration circuits of said first portion of each said common bus and operates to disable said access from said arbitration circuits of said second portion of each common bus and alternately, each said switching means operates in response to said second selection signal to enable said access from said arbitration circuits of said second portion of each said common bus and to disable said access from said arbitration circuits of said first portion of each common bus.

4,374,415

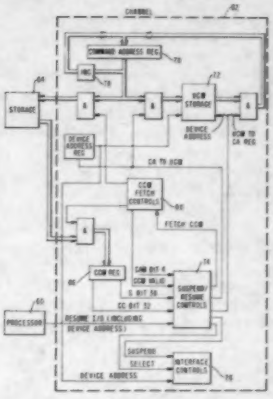
HOST CONTROL OF SUSPENSION AND RESUMPTION OF CHANNEL PROGRAM EXECUTION

Roger L. Cormier, Plessant Valley; Robert J. Dugan, Hyde Park; Richard R. Guyette, Hopewell Junction, and David H. Wansor, Hyde Park, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,876

Int. Cl.[2] G06F 3/04

U.S. Cl. 364—200 **3 Claims**



1. In an input/output device control mechanism responsive to a programmed input/output (I/O) instruction such as START I/O executed by a processor to obtain a channel address word (CAW) from a storage unit which provides the location in the storage unit for obtaining the first of a series of channel command words (CCWs) to be executed in sequence by a particular I/O device through a channel and a subchannel of the I/O device control mechanism, the improvement comprising:

suspend means in said control mechanism for causing suspension of the execution of said series of CCW's and for disengaging said device from said channel at any CCW in said series containing a manifestation to so stop execution of said CCWs, said suspend means having disabling means for preventing the suspension in absence of an enabling manifestation in said CAW authorizing said suspension; and

resume means in said control mechanism for causing the resumption of the execution of the series of CCWs at said any CCW at which a suspension occurs said resume means being responsive to a command to said I/O device control mechanism from said processor which command was generated by said processor in response to a programmed instruction to continue execution of said series of CCWs.

4,374,416

LINEAR SEQUENCING MICROPROCESSOR HAVING WORD AND BYTE HANDLING

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 52,478, Jun. 27, 1979, Pat. No. 4,301,505. This application Dec. 15, 1980, Ser. No. 216,761

Int. Cl.[3] G06F 3/00, 13/00

U.S. Cl. 364—200 **10 Claims**

1. A microprocessor system which cooperates with an application-dependent logic module to form a universal-type peripheral-controller capable of handling data transfers between a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented",

and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic means further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling said external register means, said external memory and further communicating with a decoder-controller in said microprocessor system, the said microprocessor system comprising:

(a) data processing means including:

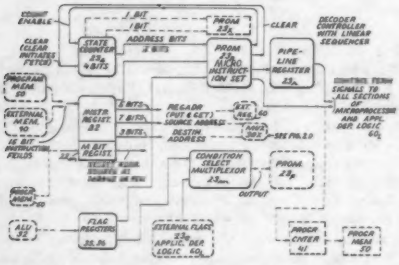
(a1) an Arithmetic Logic Unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) said shift logic circuit providing output to an I/O bus, said shift logic circuit functioning to rotate one or more bits of a word being processed to the right or to the left;

(a3) said byte swap circuit providing output to said I/O bus, said byte swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

(b) said I/O bus providing connecting lines from said data processing means to said external registers, to said external memory, to an accumulator register means, and to an addressing means;

(c) said addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an



internal program memory or said external memory, said addressing means including:

(c1) a program counter connected to said I/O bus for storing consecutive addresses of data in said internal program memory;

(c2) a memory reference register connected to said I/O bus for storing addresses of data in said external memory, and including:

(c2-1) a memory address bus which connects to said external memory;

(c2-2) and wherein a dedicated non-address bit (byte-select bit) in said memory reference register being set to signal said decoder-controller to initiate a byte-swap operation in said byte-swap circuit, or when not-set, to pass data without a byte-swap operation;

(c2-3) a bus connection from said memory reference register to said decoder-controller;

(c3) address means in said decoder-controller, connecting by means of said I/O bus, to said accumulator register means, said accumulator register means including a plurality of accumulator registers, said address means functioning to select data from an addressed accumulator register;

(d) said internal program memory for storing program instructions and data words, said internal program memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and to a memory operand register;

(e) register means for temporary storage of data, said register means including:

(e1) said accumulator register means which includes a plurality of accumulator registers providing an output to the input of said Arithmetic Logic Unit;

(e2) said memory operand register for receiving operand data from said internal program memory via said instruction bus or from said external memory via a memory data bus and providing an output to the input of said Arithmetic Logic Unit;

(e3) said instruction register for receiving instruction words from said internal program memory storage via said instruction bus and providing said instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register, and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means;

(f1) and wherein said decoder-controller further includes:

(f1o) linear sequencing means for selecting microcode instructions for execution in a predetermined sequence, said sequencing means including a microcode instruction memory for storing microcode instructions, said linear sequencing means including:

(f1o-1) a state counter connected to said microcode instruction memory for receiving count control signals from said microcode instruction memory, and for providing a first portion of address signals to said microcode instruction memory;

(f1o-2) input control lines from said instruction register to provide a second portion of address signals to said microcode instruction memory;

(f1o-3) and wherein said microcode instruction memory provides said microcode instructions for the output lines of said decoder-controller in response to said first and second address portions;

(f1a) connection means for receiving control signals from said control logic in said application-dependent logic module for performing clocking, interrupt and halt functions;

(f1b) address lines to said external registers for selecting a specific register;

(f1c) control lines, to said external registers, for strobing address signals;

(g) and wherein said register means, said internal program memory storage, and said external memory are organized into word locations of 16-bits and each word is symbolically designated as AB to indicate the two 8-bit bytes;

(h) and wherein said byte-swap circuit includes means to position a desired byte of data, which is located in the higher order position A of AB, into the lower order position, as BA, to make it available for handling as a single byte of data, said position-swapping of byte-data locations occurring only when said dedicated non-address bit in said memory reference register is SET;

(i) said memory data bus for carrying data from said external memory to said instruction register and said memory operand register.

4,374,417

METHOD FOR USING PAGE ADDRESSING MECHANISM

David J. Bradley, Boca Raton; Dennis D. Gibbs, Lighthouse Point; Donald J. Kostuch, Boca Raton, and James S. Martin, Coral Springs, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

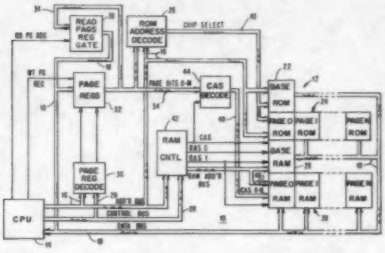
Filed Feb. 5, 1981, Ser. No. 231,639

Int. Cl.[3] **G06F** *9/30*

U.S. Cl. 364—200 **14 Claims**

1. In a data processing system which executes a series of

fetched program instructions to obtain a desired result and which includes a program counter for providing an address code, random access memory means directly addressable by said program counter, program instruction storage means for storing said program instructions and means for fetching designated program instructions, said program instructions being grouped together in program modules, said program instruction storage means being divided into a plurality of commonly addressable pages, each page including at least one page section, at least one program module having an identification code associated therewith residing in each page section, each page being selectable so that one program instruction in that page is directly addressed by said program counter, whereby that addressed instruction is designated, a method of fetching program instructions from a different program module comprising the steps of:



(a) tabulating in a page table for each page section a table of entries, each entry containing one program module identificaton code in that section and a code manifesting the address in that section for that one program module;

(b) scanning each page section table to create a transfer vector table in said random access memory, said transfer vector table being addressed in accordance with the identification code of each program module and including a pointer to the page section in which the program module having said identification code resides;

(c) looking up the pointer for the identification code of said different program module in said transfer vector table;

(d) processing the looked up pointer to obtain the address of said different program module and to select the page in which said different program module resides; and

(e) storing the obtained address in the program counter.

4,374,418

LINEAR MICROSEQUENCER UNIT COOPERATING WITH MICROPROCESSOR SYSTEM HAVING DUAL MODES

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 52,479, Jun. 27, 1979, Pat. No. 4,287,560. This application Mar. 5, 1981, Ser. No. 240,867

Int. Cl.[3] **G06F** *3/04, 9/30, 13/00, 9/00*

U.S. Cl. 364—200 **12 Claims**

1. A universal-type microprocessor system which cooperates with an application-dependent logic module to form a peripheral-controller capable of handling data transfers between main memory of a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented", and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic module further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling said external register means, said external memory and communicating with a decoder-controller in said microprocessor system, the said microprocessor system comprising:

(a) data processing means including:

(a1) an Arithmetic Logic Unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) said shift logic circuit providing output to an I/O bus, said shift logic circuit functioning to rotate one or more bits of a word being processed, to the right or to the left;

(a3) said byte-swap circuit providing output to said I/O bus, said byte-swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

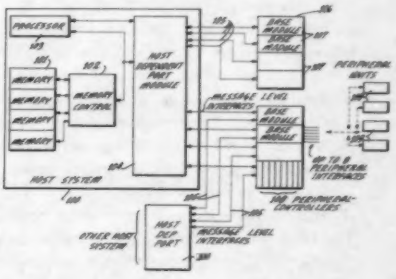
(b) said I/O bus providing connecting lines from said data processing means to said external register means, to said external memory, to an accumulator register means, and to an addressing means;

(c) said addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an internal memory or said external memory, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in said internal program memory;

(c2) a memory reference register for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to said external memory;



(c2-2) and wherein a dedicated non-address bit in each location in said memory reference register being set to signal said decoder-controller to initiate a byte-swap operation in said byte-swap circuit, or when not-set, to pass data without a byte-swap operation;

(c2-3) a bus connection from said memory reference register to said decoder-controller;

(c3) an address register in said decoder-controller connecting by means of an address bus to said accumulator register means which include a plurality of accumulator registers for selection of data from/to an one of said addressed accumulator registers;

(d) said internal program memory for storing program instruction words and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and memory operand register, said internal program memory including:

(d1) instruction words wherein each word includes a field (M) which signals said decoder-controller to select either said program counter or said memory reference register as source of the next address;

(e) register means for temporary storage of data, said register means including:

(e1) said plurality of addressable accumulator registers which provide an output to the input of said Arithmetic Logic Unit, said accumulator registers receiving input data words from said I/O bus;

(e2) said memory operand register for receiving operand data from said internal program memory via said instruction bus or from said external memory via a memory data bus;

(e3) said instruction register for receiving instruction words from said internal program memory via said instruction bus or from said external memory via said memory data bus, and providing instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register, and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means, said decoder-controller further including:

(f1) means for setting operations into one of two modes wherein a first mode, designated foreground mode, is for normal operations and a second mode, designated background mode, is for interrupt operations;

(f2) linear sequencing means for selecting microcode instructions for execution in a predetermined sequence, said sequencing means including a microcode instruction memory for storing microcode instructions, said linear sequencing means including:

(f2-1) a state counter connected to said microcode instruction memory for receiving count control signals from said microcode instruction memory, and for providing a first portion of address signals to said microcode instruction memory;

(f2-2) input control lines from said instruction register to provide a second portion of address signals to said microcode instruction memory;

(f2-3) and wherein said microcode instruction memory provides said microcode instructions for the output lines of said decoder-controller in response to said first and second address portions;

(f3) connection means for receiving control signals from said control logic in said application-dependent logic module;

(f4) address lines to said external register means for selecting a specific register;

(f5) control lines connected to said external register means for strobing address signals to said external register means;

(g) an external memory data bus for carrying data from said external memory to said instruction register and said memory operand register;

(h) and wherein said plurality of addressable accumulator registers includes:

(h1) a first set of accumulator registers, designated as foreground accumulator registers, for use during normal operations; and

(h2) a second set of accumulator registers, designated as background accumulator registers, for use during interrupt operations;

(i) and wherein said decoder-controller includes: means to select an accumulator register in said first set or said second set according to whether the foreground mode or background mode is operating.

4,374,419

DEVICE FOR DETERMINING A RADIATION ATTENUATION DISTRIBUTION IN A PLANE OF A BODY

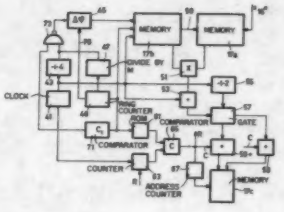
Peter W. Lux, Friedrichshafen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 8, 1980, Ser. No. 166,887

Claims priority, application Netherlands, Jul. 6, 1979, 7905282

Int. Cl.³ A61B 6/00

U.S. Cl. 364—414 **3 Claims**



1. In a device for determining a radiation attenuation distribution in a sectional plane of a body comprising:

radiation source means for generating a flat, fan-shaped beam of radiation which is directed in the sectional plane and which penetrates and spans the body;

detector means for detecting radiation from the source means which passes through the body and for supplying groups of measurement signals indicative thereof;

a supporting frame which supports the radiation source means and the detector means;

drive means for moving at least the radiation source means and the supporting frame to irradiate the body from a plurality of directions;

wherein the detector means functions to supply a group of measurement signals for each of said directions, which groups represent radiation attenuation along each of a group of measurement paths which extend fan-wise from the radiation source means; and further including

processing means which function to convolute a group of measurement signals with a series of numbers and to back-project the measurement signals thus convoluted to obtain the distribution of radiation attenuation values in the body;

and memory means, connected to the processing means, which function at least to store the measurement signals and the distribution of attenuation values;

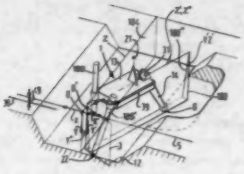
the improvement wherein:

the memory means comprises a first memory for storing attenuation values and a second memory for storing weighting values for use during backprojection of the convolved values, the attenuation values and weighting values being stored, respectively, at locations in the first and second memories which correspond to locations in the sectional plane which are defined by polar coordinates; and wherein the processing means transmits a distance coordinate signal and an angle coordinate signal to the first and second memories which signals function to address locations therein.

4,374,420
METHOD OF ACCURATELY DREDGING A DESIRED PROFILE CONTOUR

Tjako A. Wolters, Zeist, Netherlands, assignor to Ballast-Nedam Groep N.V., Amstelveen, Netherlands

Filed Apr. 28, 1980, Ser. No. 144,650
Claims priority, application Netherlands, May 14, 1980, 7903782
Int. Cl.³ G05D 1/10; E02F 3/18
U.S. Cl. 364—424 7 Claims



7. The method of dredging which comprises the steps of:

(a) orienting a buoyant cutter dredger hull by means of radio beacons such that the centerline of the hull is substantially located within a vertical plane which defines the Y,Z plane of an X, Y, Z coordinate system with respect to which the depth coordinates Y and side slope coordinates X of a desired profile for a channel are known,

(b) anchoring the hull to define a pivot point whose location is fixed with respect to said Y,Z plane while the hull is oriented as in step (a) and swinging the cutter of the cutter dredger downwardly into engagement with subaqueous ground;

(c) swinging said dredger about said pivot point thereby to swing the cutter in known manner with relation to X, Y, Z coordinate system;

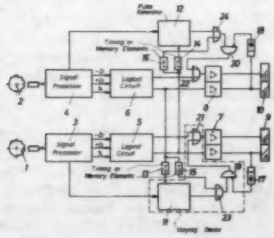
(d) mathematically simulating the cutting envelope of said cutter as at least one imaginary sphere of fixed radius; and

(e) controlling the sideways translation of said cutter to cause the simulated cutting envelope to move into close conformity with said known side slope coordinates of the desired profile for a channel without exceeding the X coordinates thereof.

4,374,421
ANTI SKID CONTROL SYSTEM

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 19,522, Mar. 12, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,632
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2812000
Int. Cl.³ G06F 15/20; B60T 8/02
U.S. Cl. 364—426 7 Claims



1. An anti skid control system for a wheeled vehicle, comprising:

a pair of brake pressure control channels with one of said pair of brake pressure control channels associated with each opposite wheel on one axle,

each said brake pressure control channel including a wheel speed transducer for generating an output signal related to the rotation of an individual wheel,

each said output signal being applied to a signal processor, said signal processor directing at least one output signal to a logical circuit which produces an output signal which actuates a brake pressure control valve assembly which controls the brake pressure applied to said individual wheel,

each of said brake pressure control channels including means for varying the rate of increase of braking pressure,

the two control channels associated with the wheels on opposite sides of one vehicle axle being interconnected and including means reducing the rate of increase of the braking pressure in the other channel when one of the wheels tends to lock up,

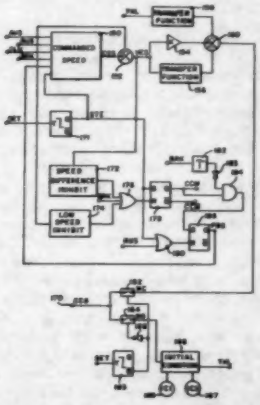
means for varying the reduction of the rate of increase of the braking pressure as a function of vehicle speed, the rate of increase of braking pressure decreases with increasing vehicle speed, and

switching means for initiating a constant pressure phase upon the occurrence of a tendency of one of the wheels to lock up and prior to the switchover to the reduced rate of pressure increase.

4,374,422
AUTOMATIC SPEED CONTROL FOR HEAVY VEHICLES

Patrick J. O'Keefe, Jr., Elyria, Ohio, and Harold E. Weissler, II, Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 27, 1980, Ser. No. 201,091
Int. Cl.³ B60K 31/00; G06G 7/70
U.S. Cl. 364—426 16 Claims



1. An automatic speed control system for a vehicle comprising means for generating a speed error signal proportional to the difference between an actual speed signal and a commanded speed signal; and means for generating a control signal as a function of said speed error signal wherein said control signal positions a throttle member regulating the actual speed of the vehicle to reduce said error signal; said control signal generating means including:

means for generating a proportional error signal dependently upon said speed error signal and of the same sign as said control signal;

means for generating a feedforward error signal of the oppo-

site sign of said control signal which is proportional to the change in the speed error signal;

means for generating a feedback position signal of the opposite sign of said control signal which is proportional to the change in the position of the throttle member; and

means for combining said proportional error signal, said feedforward error signal, and said feedback position signal to form said control signal.

4,374,423

ARRANGEMENT FOR MONITORING A RUDDER CONTROL SYSTEM

Walter Kundler, Hamburg; Reinhold Pientak, Dänischenhagen; Claus Schulz, Altenholz-Klausdorf, and Wolfgang Skerka, Rendsburg, all of Fed. Rep. of Germany, assignors to Anschütz & Co. GmbH, Kiel-Wik, Fed. Rep. of Germany

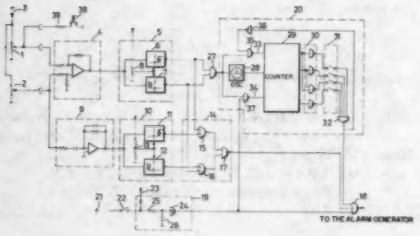
PCT No. PCT/DE79/00083, § 371 Date Apr. 30, 1980, § 102(e) Date Apr. 30, 1980, PCT Pub. No. WO80/00506, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 13, 1979, Ser. No. 193,404

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837842

Int. Cl.³ G06F *15/50*; G05B *23/02, 11/42*

U.S. Cl. 364—434 **4 Claims**



1. Arrangement for monitoring a rudder control system, containing a transmitter for generating a set-point signal corresponding to the respective desired angular position of the rudder and facilities for turning the rudder subsequently to the angular position provided by the set-point signal, the actual angular position of the rudder being picked up by a receiver which supplies a corresponding control-point signal, further containing a first limit circuit (5) to which the difference between the set-point signal and the control-point signal is applied and which supplies an error signal if the applied difference between the set-point signal and the control-point signal exceeds a predetermined limit, a second limit circuit (10), which supplies an error signal corresponding to the turning rate of the rudder, an evaluation circuit (14) to which the output signals of the two limit circuits (5,10) are applied for supplying a drive signal for an alarm generator if two error signals are present, dependent upon an input signal coming from the first (5) and the second (10) limit circuits, and a delay circuit (20) responsive to said first limit circuit for enabling the alarm generator to be triggered by a drive signal, present at the output of the evaluation circuit (14), only after a predetermined period of time has elapsed during which an output has been provided by said first limit circuit, characterized by

the provision of a differentiating circuit (9) to which the control-point signal is applied for producing a signal corresponding to the rate of change of the control-point signal and supplying it to the second limit circuit (10);

the provision in said second limit circuit of two limit elements (11,12), one for producing a first signal when the rate of change of said control point signal in a positive-going direction exceeds a predetermined minimum and otherwise producing a second signal, and the other for producing a first signal when the rate of change of said control-point in a negative-going direction exceeds a predetermined minimum and otherwise producing a second signal;

the provision in said first limit circuit of two limit elements (6,7), one of which (6) supplies an error signal when a positive signal limit is exceeded and the other one (7) of which supplies an error signal when a negative signal limit is exceeded;

provision of a pair of logic circuits (15,16), one for each polarity of error signal, in said evaluation circuit (14) for responding to the presence of an error signal from the limit element of said first limiting circuit relating to said polarity during the presence of said first signal from the limit element of said second limit circuit (10) corresponding to the same polarity;

provision of the error signals of the two limit elements (6,7) also at the same time to an additional logic circuit (27) for supplying an activation signal to the delay circuit (20), and

provision of a final logic circuit (18) for producing an alarm signal in response to the output of said evaluation circuit (14) after the delay circuit (20) has provided a signal to said final logic circuit indicating that said delay circuit has been activated for a predetermined period.

4,374,424

APPARATUS AND METHOD FOR PLOTTING A CHROMATOGRAM

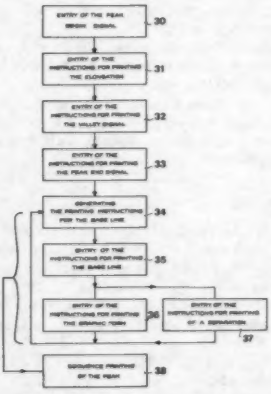
Andre Coustre; Robert Elitzsch, and Jean-Claude Caullier, all of Conflans-Sainte-Honorine, France, assignors to Delsi, Suresnes, France

Filed Nov. 23, 1979, Ser. No. 96,669

Claims priority, application France, Nov. 28, 1978, 78 33607

Int. Cl.³ G01N *31/08*

U.S. Cl. 364—497 **7 Claims**



1. A method for displaying a continuous signal having a time varying elongation and including at least one peak provided by an external analysis apparatus, comprising the steps of:

sampling the continuous signal at a plurality of sampling times and determining an elongation value of the continuous signal for each sample;

detecting the starting time and ending time for the peak of the continuous signal;

storing the elongation values for each sample taken from the starting time to the ending time of the peak;

calculating, from the elongation values, baseline data comprising baseline magnitude values corresponding to the sampling times and varying from a baseline value corresponding to the elongation value at the starting time of the peak to a baseline value corresponding to the elongation value at the ending time of the peak; and

generating a printing control signal from the stored data and

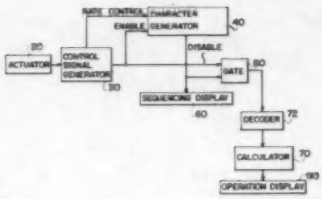
the calculated baseline data for commanding an external printer to print the elongation values and corresponding baseline data in the form of a graphic.

4,374,425

SINGLE ACTUATOR ELECTRONIC MINICOMPUTER

Louis R. Fuka, 2073 North Rd., Los Alamos, N. Mex. 87544

Filed Jul. 30, 1980, Ser. No. 173,701
Int. Cl.³ G06F *3/02, 15/02*
U.S. Cl. 364—709 **10 Claims**



1. A single actuator electronic digital calculator device, comprising a display, electronic sequencing means for providing sequencing of the display through a plurality of characters representing both data and data operations, a digital calculator means for processing data signals in accordance with data operator signals, and a single switch means controlled by the operator of the device for, in a first state thereof, actuating said electronic sequencing means so as to provide sequencing of said display and for, in a second state thereof, deactivating said sequencing means to provide selection of a said character and for causing entry of a digitally encoded signal representing the selected character into said calculator means, said electronic sequencing means comprising character generator means for, when actuated, generating a said plurality of characters on a continuous, cyclic basis, and said display comprising an electronic display means, responsive to said character generator means, for displaying said characters in sequence on a continuous cyclic basis when said character generator means is actuated, said device further comprising a single actuator for actuating said switch means, said actuator, in a first state thereof, causing switching of said switch means to the first state of said switch means and, in a second state thereof, causing switching of said switch means to said second state of said switch means, and means responsive to said single actuator for controlling the sequencing rate of said electronic sequencing means over a continuous spectrum of rates.

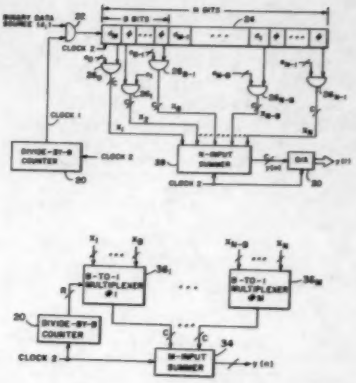
4,374,426

DIGITAL EQUALIZER FOR HIGH SPEED COMMUNICATION CHANNELS

Donald W. Burlage, 823 Tannahill Dr., Huntsville, Ala. 35802, and Ronald C. Houts, 389 Woodland Hills, Tuscaloosa, Ala. 35405

Filed Nov. 14, 1980, Ser. No. 207,045
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 **5 Claims**

1. A digital equalizer for high-speed communication channels comprising: a shift register having an input adapted for receiving a binary data signal and providing a plurality of separate and distinct outputs therefrom in response to said binary data input; summing means having a plurality of inputs and an output; a plurality of multiplexers; and a plurality of AND gates, said AND gates being coupled respectively between said multiplexers and respective outputs of said shift register for providing a gated or controlled output from each of said respective shift register outputs to said multiplexers; each of said AND gates having a first input coupled to a respective shift register output and having a second input adapted for receiving a controlling signal input to initiate passage of register data to said multiplexers; and said multiplexers being coupled between preselected sequential outputs of said AND gate outputs and said summing means inputs, each of said multiplexers having a plurality of inputs and a single output and disposed for sequentially receiving a selected number of said AND gate outputs indicative of signals received for a predetermined timed interval, each AND gate having a single output coupled to provide a single input to a multiplexer, said multiplexers outputs being coupled to said summing circuit.

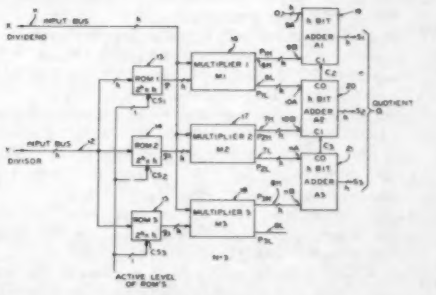


4,374,427

DIVISOR TRANSFORM TYPE HIGH-SPEED ELECTRONIC DIVISION SYSTEM

Aisuke Katayama, 2-47, Kawamotomutsumicho, Akita-shi, Akita, Japan

Continuation of Ser. No. 179,702, Aug. 20, 1980, abandoned. This application Oct. 7, 1980, Ser. No. 194,838
Claims priority, application Japan, Aug. 25, 1979, 54-107670
Int. Cl.³ G06F *7/52, 7/544*
U.S. Cl. 364—761 **17 Claims**



1. An electronic division system comprising means for transforming an input divisor signal into a given number of integers, said given number being a number selected on a basis of a desired accuracy index, means for separately multiplying each of said given number of transformed divisor signals by a dividend signal to produce said given number of multiplication products, and means comprising said given number of adders for adding at least some of the products of said multiplication

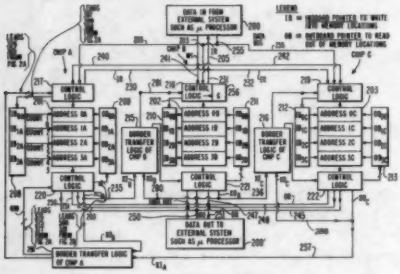
to produce a quotient signal which is equal to a quotient of said dividend divided by said divisor.

4,374,428

EXPANDABLE FIFO SYSTEM

Kerry B. Barnes, Collingswood, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,526
Int. Cl.³ G11C *9/00, 9/02, 21/00*
U.S. Cl. 364—900 **9 Claims**



1. A FIFO system comprising an exandable number N of FIFO chips arranged to form a ring of identical FIFO chips connected in an identical manner and with each FIFO chip comprising:

a RAM memory having N word storage locations;

inboard pointing means which, when activated, points to, and directs the writing of words into, successive ones of said word storage locations with each word remaining in its word storage location until read out of the FIFO system;

outboard pointing means which, when activated, points to, and directs the reading of words from, successive ones of said word storage locations;

first control means responsive to the presence or absence of a word in the last word location in the RAM memory in any given FIFO chip to produce a first signal $XO_n=1$ or a second signal $XO_n=0$, respectively;

second control means responsive to the presence or absence of a word in the last word location in the RAM memory in the FIFO chip immediately preceding said given FIFO chip in the ring of FIFO chips to produce a third signal $XO_{n-1}=1$ and a fourth signal $XO_{n-1}=0$, respectively;

border transfer logic means resident in said each FIFO chip and connecting said each FIFO chip with the immediately preceding FIFO chip in said ring of FIFO chips

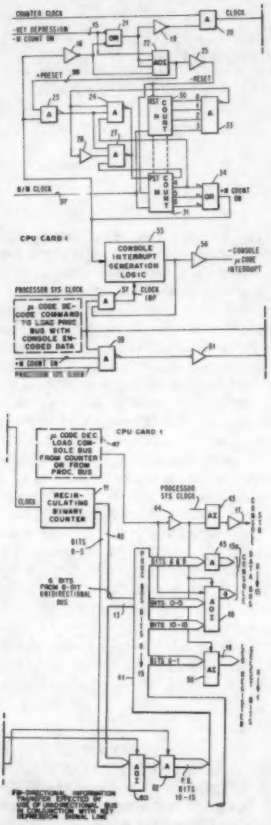
and responsive to the presence of a word in the last word location in said preceding FIFO chip RAM memory ($XO_{n-1}=1$) to activate said inboard printing means in said given FIFO chip only when $XO_n=0$ and to deactivate said inboard pointing means in said given FIFO chip when $XO_n=1$ and further responsive to the absence of a word in the last word location in said preceding FIFO chip RAM memory ($XO_{n-1}=0$) to activate said outboard pointing means in said given FIFO chip when $XO_n=1$, and to deactivate said outboard pointing means in said given FIFO chip when $XO_n=0$.

4,374,429

INFORMATION TRANSFER SYSTEM WHEREIN BIDIRECTIONAL TRANSFER IS EFFECTED UTILIZING UNIDIRECTIONAL BUS IN CONJUNCTION WITH KEY DEPRESSION SIGNAL LINE

Jack W. Cannon, Boca Raton; Bradley D. Herrman, Pompano Beach, and Ramiro Ramirez, Jr., Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,601
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **8 Claims**



1. An information transfer system, said system utilizing digital data to represent information, said digital data being represented by coded characters, said system incorporating a central processing unit having facilities for processing said digital data and for supplying digital data processor output signals indicative of status information and the like and responding to digital data input signals in said system, and said system requiring transfer of said digital data in both an output direction from said central processing unit and in an input direction to said central processing unit, said central processing unit having a processor bus for transferring digital data in said system, said system comprising:

a device externally located from said central processing unit, said device being activatable to selectively provide a predetermined number of distinct digital data signals for input to

said central processing unit and said device further comprising a selectively operable advisory unit, said advisory unit being responsive to digital data output signals from said central processing unit to provide advisory information;

a device data bus for receiving and transferring digital data from said central processing unit in an output direction only;

counter means incorporated in said central processing unit and operable in a count mode and a stop mode, said counter means being operable responsive to a start signal to provide a count sequence of digital data signals corresponding in number and code configuration to the predetermined number of distinct digital data input signals provided by said device, and said counter means being operable responsive to a stop signal to provide signals representative of the digital data signals that are active when said counter means is stopped;

data transfer bus means operable in a first mode for interconnecting said counter means to said device data bus for transfer of counter signals to said device and operable in a second mode for interconnecting said processor bus to said device data bus for transfer of processor output signals to said device, said data transfer bus means having bus drive means to drive said device data bus so that digital data from said counter means in said first mode and from said processor bus in said second mode is transferred via said device data bus in an output direction only from said central processing unit to said device, thereby making said device data bus unavailable for transfer of digital data in an input direction from said device to said central processing unit;

comparator means in said device, said comparator means being operable to compare the count sequence of digital data signals received from said counter means via said device data bus when said counter means is in a count mc [illegible] and said data transfer bus means is in said first mode of op[illegible]ation and digital data signals provided by said device when activated, respectively, and said comparator means having a single input signal line interconnected from said device to said counter means in said central processng unit and said comparator means being further operable to provide an input signal via said single input signal line to change the state of said counter means from a count mode to a stop mode when digital data signals from said counter means and digital data signals from said device are identical whereby said counter means is stopped in a count state representative of a particular one of said distinct digital data signals currently activated at said device thereby accomplishing transfer of the digital data from said device in an input direction to said central processing unit by utilizing only said single input signal line and whereupon the state of said counter means and accordingly the identity of the particular one of said distinct digital data signals currently activated can be determined by said central processing unit;

advisory selection and operating means responsive to digital data signals supplied by said central processing unit via said processor bus and said device data bus when said data transfer bus means is in said second mode of operation for selectively operating said advisory unit in accordance with status information and the like from said central processing unit.

4,374,430

SEMICONDUCTOR PROM DEVICE

Mitsuo Higuchi, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,675

Claims priority, application Japan, Nov. 26, 1979, 54-152832

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—104 **6 Claims**

1. A semiconductor PROM device operatively connected to receive input address signals, a high potential voltage, and a programming signal, comprising:

a plurality of word lines;

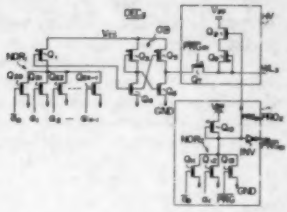
a plurality of word address decoders organized in blocks and operatively connected to respective of said word lines, each of said word address decoders including:

a decoder section for receiving said input address signals and for selecting said respective word line in accordance with said input address signals; and

a high potential voltage supplying section, for receiving and providing said high potential voltage, including

a first transistor which is connected between a respective one of said word lines and said high potential voltage and which is turned on in dependence upon said programming signal; and

a second transistor which is connected between an output terminal of said decoder section and said respective one of said word lines,



a plurality of gated program signal generators, operatively connected to respective ones of said blocks of word address decoders, for receiving specified signals of said input address signals and for generating a gated program signal for selecting said respective ones of said blocks of word address decoders, each of said blocks comprising one or more of said word address decoders associated with said specified signals of said input address signals, and said gated program signal corresponding to said programming signal being applied to the gate electrode of said first transistor of said respective word address decoder having input address signals including said specified signals of the input address signals received by said gated program signal generator.

4,374,431

I²L SEMICONDUCTOR MEMORY CIRCUIT DEVICE

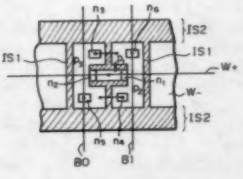
Chikai Ono, Kawasaki, and Kazuhiro Toyoda, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,678

Claims priority, application Japan, Nov. 28, 1979, 54/154025; Nov. 30, 1979, 54/155340

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—174 **23 Claims**



1. A semiconductor memory device fabricated on a bulk semiconductor base having parasitic capacitance, comprising:

a plurality of memory-cell arrays, each of the memory-cell arrays extending in a first direction and including a plurality of IIL (integrated injection logic) memory cells for storing data arranged in the first direction, the memory-

cell arrays being arranged with a specified pitch in a second direction perpendicular to the first direction;

word line pairs arranged in the first direction, each pair having first and second word lines, and each word line having a selection and non-selection status and each of the second word lines comprising said bulk;

the memory-cell arrays respectively, operatively connected to a corresponding one of said pairs of word lines;

a plurality of pairs of bit lines extending in the second direction and operatively connected to each of said plurality of memory cell arrays;

hold-current sources respectively, operatively connected to a corresponding one of said second word lines, for holding the data stored in the IIL memory cells;

at least one discharging path, operatively connected to each of the second word lines; and

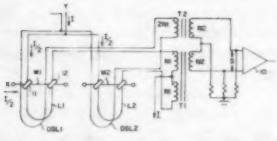
constant-current sources, operatively connected to said discharging path, for providing a discharging current, in accordance with said parasitic capacitance existing in the bulk and along the word lines, for the second word lines changing from said selection status to said non-selection status, said parasitic capacitance being discharged through the constant-current source via the discharging path.

4,374,432

READ SYSTEMS FOR 2½D COINCIDENT CURRENT MAGNETIC CORE MEMORY

Bernard A. Kenner, Rancho Palos Verdes, and John R. Conaway, San Jose, both of Calif., assignors to Electronic Memories and Magnetics Corporation, Encino, Calif.

Filed May 29, 1979, Ser. No. 42,796
Int. Cl.³ G11C *5/08, 7/02, 11/06*
U.S. Cl. 365—209 **14 Claims**



1. In a coincident current magnetic core memory comprised of an array of toroidal cores, each core having a bit line driven by half select current and a word select line driven by half select current, an organization for cancellation of crosstalk produced in the bit drive signal on a selected bit line by a drive pulse in a word select line prior to amplification of a bit signal on the selected bit line comprising the arrangement of an unselected bit line physically parallel to the selected bit line for approximately the same inductive and capacitive coupling of a word drive pulse from the word select line, and subtracting means for subtracting the signal coupled into the unselected bit line from the signal coupled into the selected bit line by the word select pulse, wherein said selected bit line and said unselected bit line are paired bit select lines connected to receive bit select current from a controlled source and selectively connected by bit select switching means to conduct half select current to one terminal of said subtracting means, only one of said pair of bit select lines being selected to conduct bit select current to said subtracting means, and switching means for automatically connecting said unselected line to the other terminal of said subtracting means for conduction of bit select current at a level significantly reduced below the half select level of current to the one terminal of said subtracting means.

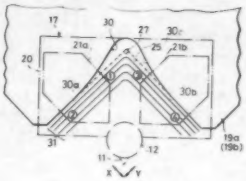
4,374,433

STEREO PICKUP WITH PRINTED CIRCUIT COILS MOUNTED IN A LINEAR FIELD

Hiroshi Ogawa, Yokohama; Kazuhiro Sato; Norio Shibata, both of Sagamihara; Katsuhiko Oguri, Fujisawa; Masayoshi Utida, Yokohama, and Tsuyoshi Ono, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Continuation of Ser. No. 923,943, Jul. 11, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,261

Claims priority, application Japan, Jul. 13, 1977, 52-92817[U]; Jul. 13, 1977, 52-92818[U]; Jul. 13, 1977, 52-92820[U]; Jul. 13, 1977, 52-92821[U]; Jul. 25, 1977, 52-99240[U]
Int. Cl.³ H04R *9/16, 9/04*
U.S. Cl. 369—136 **8 Claims**



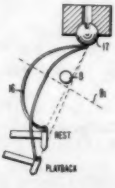
1. A moving-coil type stereo pickup cartridge, comprising, a vibration system including a stylus for tracing a sound groove of a record disc; at least one coil plate provided in said vibration system to vibrate in response to vibrations of said stylus; and means for forming a magnetic field for said coil plate, said coil plate comprising a thin insulative substrate and a pair of left and right coils substantially symmetric with respect to a center line of said coil plate, said coils being formed by an electrically conductive thin film in a spirally wound pattern on at least one surface of said substrate, and said magnetic field forming means comprising a permanent magnet piece and a pair of yoke pieces clamping said permanent magnet piece, said pair of yoke pieces having surfaces at the ends thereof for defining a gap therebetween in which said coil plate is interposed and a cutout recessed in each of said ends of said yoke pieces with a configuration having a substantially inverted V-shape, each of said ends of said yoke pieces having an edge for defining said cutout, the shape of said edge being configured and dimensioned to form the contour lines of magnetic flux density of leakage magnetic flux within the space defined by said cutout and passing through said coils to extend in a substantially linear direction and substantially parallel to each other.

4,374,434

VIDEO DISC STYLUS CARTRIDGE WITH PROTECTIVE MEMBER

Donald T. Hatin, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 24, 1980, Ser. No. 190,274
Int. Cl.³ G11B *3/46*
U.S. Cl. 369—170 **4 Claims**



1. In a record playback cartridge assembly of the type comprising: a cartridge body, a stylus arm mounted within said cartridge body; a pickup stylus mounted on one end of said

arm, the other end of said arm being compliantly coupled to said cartridge body; and an elongated electrically conductive spring-like flylead member, connected at one end thereof to said cartridge body and at the other end thereof to a certain point in the vicinity of said stylus for coupling electrical signals representing recorded information during record playback, said flylead normally assuming a bow-like shape extending away from the end connections of said flylead and toward said other end of said arm, said flylead being subject to disturbance of said bow-like shape during handling of said cartridge at times other than when said cartridge is positioned for record playback, the improvement comprising:

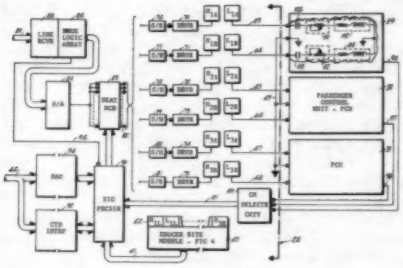
a stop member formed from an electrically non-conductive material and connected between two opposing walls within the confines of said cartridge body on the side of said flylead bow-like shape toward said one end of said arm in the vicinity of but non-contacting with said flylead member for preventing the inversion of said bow-like shape of said flylead during handling of said cartridge, said stop member being positioned so as not to touch said flylead at any time during record playback.

4,374,435

PASSENGER ENTERTAINMENT SYSTEM TRANSDUCER FAILURE DETECTOR

Richard F. Lach, Hartford, Conn., and Richard W. Calcasola, Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1980, Ser. No. 219,740
Int. Cl.³ H04J 3/14
U.S. Cl. 370—13 **9 Claims**



1. Transducer BITE sensor for providing signal manifestations, to the BITE circuitry of a passenger entertainment system (PES), of the response of the audio transducers and associated driver amplifiers of one or more PES headsets to an audio test signal presented to each headset amplifier driver individually during a PES transducer BITE test routine, comprising:

voltage sensing means, connected to the signal output of each driver amplifier for sensing the peak-to-peak amplitude of the output voltage signal response of each amplifier to the presentation of the audio test signal, as an indication of the driver amplifier operation, and for providing for each amplifier under test a voltage BITE signal manifestation indicative thereof to the PES BITE circuitry; and

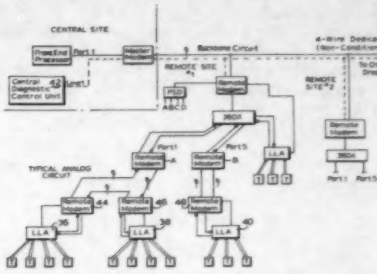
current sensing means, connected to the signal output of each driver amplifier, for sensing the presence of a current signal component in the output signal response of each driver amplifier to the presentation of the audio test signal, as an indication of the related audio transducer operation, and for providing for each transducer under test a current BITE signal manifestation indicative thereof to the PES BITE circuitry.

4,374,436

SYSTEM FOR THE MONITORING AND RESTORATION OF SERIES TERMINALS IN A LOOPED COMMUNICATION SYSTEM

Thomas R. Armstrong, Largo, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Oct. 17, 1980, Ser. No. 198,234
Int. Cl.³ G06F 11/20
U.S. Cl. 371—11 **5 Claims**



1. A local loop adapter system for selectively disconnecting a terminal from a loop of interconnecting terminals, comprising:

a controller and

a plurality of switch assemblies each having incoming connecting means, on which data is received from a first terminal;

terminal connecting means on which data is sent to and received from a second terminal;

outgoing connecting means on which data is sent to a third terminal switching means which on command from the controller allows either data from said incoming connecting means to go to said second terminal, and allows data from said second terminal to go to said outgoing connecting means, or

allows data from said incoming connecting means to go directly to said outgoing connecting means, ignoring all data receiving from said second terminals; and

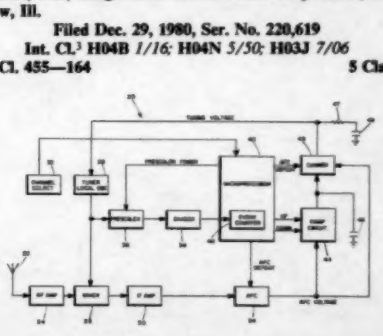
control means provided to operate the switching means on command from said controller.

4,374,437

VARIABLE RAMP SPEED TV TUNING SYSTEM FOR RAPID CHANNEL TUNING

Richard W. Citta, Portland, Oreg., and Scott L. Falater, Melbourne, Fla., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 29, 1980, Ser. No. 220,619
Int. Cl.³ H04B 1/16; H04N 5/50; H03J 7/06
U.S. Cl. 455—164 **5 Claims**



1. In a signal seeking television tuning system including tuning means for developing a local oscillator signal, channel

selector means for providing signals representative of a selected VHF, UHF or CATV television channel to said tuning means, mixer means for combining said local oscillator signal with a received television signal in generating an intermediate frequency signal, automatic frequency control means coupled to said mixer means for detecting the video components of said intermediate frequency signal and for locking said tuning means to the carrier frequency of said received television signal, a system for providing a tuning voltage to said tuning means comprising:

frequency divider means coupled to said tuning means for generating a divided-down local oscillator signal;

variable, programmable counter means coupled to said frequency divider means for receiving and measuring the frequency of said divided-down local oscillator signal with a given frequency measuring resolution;

counter control means coupled to said programmable counter means for changing the frequency measuring resolution of said programmable counter, said counter control means including:

loading means for sequentially providing a plurality of control inputs to said programmable counter means with the counting interval of said counter means changed in response thereto, wherein each successive counting interval is of increasing duration; and

clock generator means for applying a clock pulse train to said counter means during each of said counting intervals, the duration of each of said counting intervals determining the frequency measuring resolution of said counter means, with the frequency measuring resolution of said counter means increasing with increasing counting interval duration;

programmable comparator means coupled to said counter means for comparing the divided-down local oscillator signal frequency with a predetermined frequency representing a selected channel and for generating a tuning voltage correction signal representing the difference between said frequencies; and

variable ramp voltage generating means coupled to said comparator means and to said tuning means for receiving said tuning voltage correction signal, developing a tuning voltage signal in response thereto, and providing said tuning voltage signal to said tuning means in ramping said divided-down local oscillator signal toward said predetermined frequency representing the selected television channel at a given ramping rate, the ramping rate of said ramp voltage generating means being successively decreased in a step-wise manner when the frequency difference between said local oscillator signal and said received television signal is within the frequency measuring resolution of said counter means in rapidly tuning said television receiver to said selected channel.

4,374,438

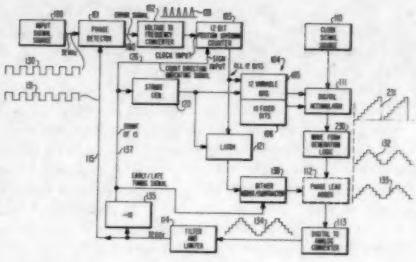
DIGITAL FREQUENCY AND PHASE LOCK LOOP

Albert T. Crowley, Gloucester Township, Camden County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,999

Int. Cl.³ H04B *1/16*; H03L *7/08*; G01S *9/56*

U.S. Cl. 455—265 **5 Claims**



1. In a communication system including phase locked loop means for phase locking a locally generated signal with a cyclical portion of a received signal and comprising:

signal value producing means comprising an accumulator, an input register containing a variable value and means including a clock signal source for enabling supply of said variable value to said accumulator at the frequency of said clock signal, with said accumulator being responsive to said variable value being supplied thereto to produce a series of output values representative of a frequency of said locally generated signal;

signal processing means responsive to said series of output values to produce said locally generated signal;

logic means responsive to said locally generated signal and said cyclical portion of said receiver signal to produce an error voltage indicative of the phase difference therebetween and to produce a periodic two level signal;

voltage to frequency converting means for converting said error voltage into a count control signal whose frequency is proportional to said error voltage;

up/down counter means responsive to said count control signal and to said two level periodic signal to count at a rate equal to the frequency of said control signal and in a direction determined by said two level periodic signal to provide a variable output count value; and

means responsive to said periodic two level signal for altering the variable value contained in said input register to correspond to said variable output, count value of said up/down counter means.

DESIGN PATENTS

GRANTED FEB. 15, 1983

ERRATA

For CLASS	See PATENT NO.
D23–138	267,924

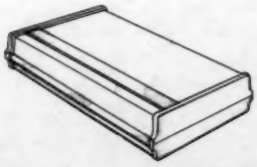
DESIGNS

FEBRUARY 15, 1983

267,908
STUFFED FOOD PRODUCT
Carl Lomauro, 200 Harding Ave., Clifton, N.J. 07011
Continuation-in-part of Ser. No. 873,985, Apr. 20, 1978. This application Nov. 5, 1979, Ser. No. 91,320
Term of patent 14 years
Int. Cl. D01—*04*
U.S. Cl. D1—2

267,909
LINK FOR BRASSIERES
Gerhard Fildan, Kriehubergasse 31, A-1050 Vienna, Austria
Filed Feb. 1, 1980, Ser. No. 117,524
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—409

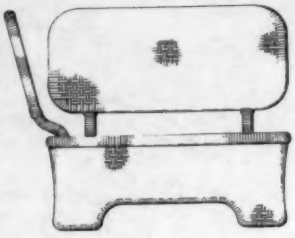
267,910
CASING FOR A CONTACT LENS CASE
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Nov. 17, 1980, Ser. No. 207,265
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—34



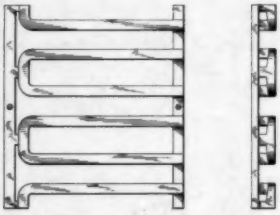
267,911
DISKETTE STORAGE CONTAINER
Jerry M. Long, Ben Lomond, and James A. Womack, Livermore, both of Calif., assignors to Innovative Concepts, Inc., Los Gatos, Calif.
Filed Oct. 1, 1979, Ser. No. 80,417
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

267,912
DINING CHAIR
Karl Rausch, Im Rosengartle 15, 7500 Karlsruhe-Durlach, Fed. Rep. of Germany
Filed Jul. 11, 1980, Ser. No. 167,529
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—74

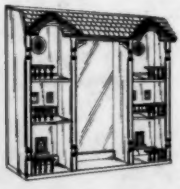
267,913
CHAIR
Mike T. Claman, New York, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Jul. 10, 1980, Ser. No. 168,209
The portion of the term of this patent subsequent to Aug. 15, 1986, has been disclaimed.
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—78



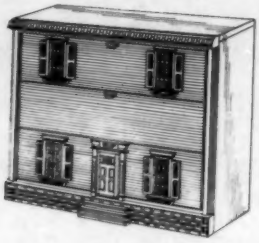
267,914
RACK FOR HOLDING STEMWARE GLASSES
Richard A. Lin, 16530 Drexel Ave., South Holland, Ill. 60473
Filed Sep. 15, 1980, Ser. No. 187,195
Term of patent 14 years
Int. Cl. D6—*04*; D7—*99*
U.S. Cl. D6—113



267,915
MIRRORED HUTCH OR SIMILAR ARTICLE
Sidney A. Lenger, Jr., Jamestown, N.C., assignor to The Singer Company, Stamford, Conn.
Filed Sep. 12, 1980, Ser. No. 186,815
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—153

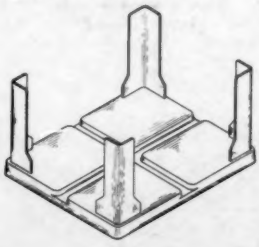


267,916
CHEST OF DRAWERS OR SIMILAR ARTICLE
Sidney A. Lenger, Jr., Jamestown, N.C., assignor to The Singer Company, Stamford, Conn.
Filed Sep. 12, 1980, Ser. No. 186,821
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

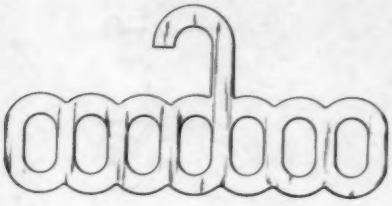


267,917
PISTOL CABINET
Adaire M. Faldmo, and Robert Faldmo, both of 1528 Wagon Wheel Cir., Salt Lake City, Utah 84070
Filed Nov. 3, 1980, Ser. No. 203,126
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—181

267,918
PAPER BALING RACK
George D. Lasher, 612 E. Shields, Fresno, Calif. 93704
Filed Sep. 12, 1980, Ser. No. 186,685
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



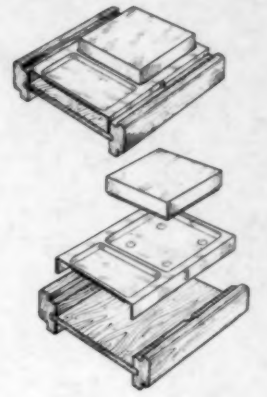
267,919
HANGER
Georgette Owens, 165½ Lower Via Casitas, Greenbrae, Calif. 94904
Filed Sep. 29, 1980, Ser. No. 192,048
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247



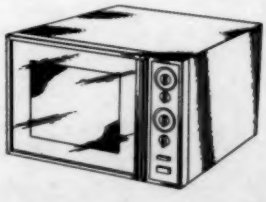
267,920
GARMENT HANGER BODY
John H. Batts, East Grand Rapids, and Everett L. Duester, Zeeland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed Aug. 15, 1980, Ser. No. 178,552
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254

267,921
GARMENT HANGER
John H. Batts, East Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Continuation of Ser. No. 140,109, Apr. 14, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,658
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254

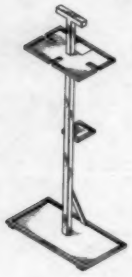
267,922
COMBINED COOKING PLATE, DRIP PAN TRAY AND SUPPORT STAND
Riccardo Schweizer, Via Roma, 41, Mezzano Di Primiero (Province of Trento), Italy
Filed Jul. 28, 1980, Ser. No. 172,500
Claims priority, application Italy, Jan. 29, 1980, 30627 B/80
Term of patent 14 years
Int. Cl. D7—*02, 99*
U.S. Cl. D7—363



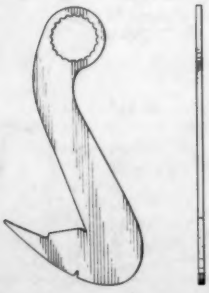
267,923
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 21, 1980, Ser. No. 170,705
Claims priority, application Japan, Feb. 4, 1980, 55-3692
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—351



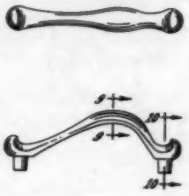
267,924
FIREPLACE TOOL HOLDER
Benjamin A. Rhoades, Rte. 1, Box 126, Arroyo Grande, Calif. 93420
Filed Sep. 12, 1980, Ser. No. 186,711
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D23—138.2



267,925
COMBINED BOTTLE OPENER AND CAN OPENER
Martin R. La Mancusa, 11 Guise Dr., Munroe Falls, Ohio 44262
Filed Jan. 22, 1981, Ser. No. 227,161
Term of patent 14 years
Int. Cl. D7—*099*
U.S. Cl. D8—18



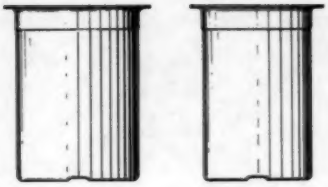
267,926
PULL
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 24, 1980, Ser. No. 219,818
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—318



267,927
DISPENSING CONTAINER
Robert C. Smith, Short Hills, N.J., assignor to Unette Corporation, Parsippany, N.J.
Filed Feb. 23, 1981, Ser. No. 237,099
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—302

267,928
PACKAGING CONTAINER
William T. Bianchi, 3439 1st Ave., #5, Sacramento, Calif. 95817
Filed Feb. 20, 1981, Ser. No. 236,450
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—329

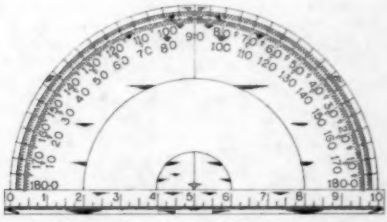
267,929
FOOD CONTAINER
Roland Torterotot, Longvilliers, France, assignor to Etudes Realisations de Chaines Automatiques, France
Filed Oct. 30, 1980, Ser. No. 202,252
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—370



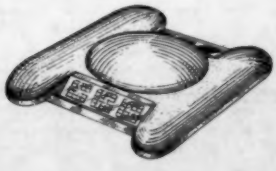
267,930
CHILD-SAFE ACTUATOR FOR PRESSURIZED CONTAINER
Robert E. Corba, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Continuation-in-part of Ser. No. 786,750, Apr. 11, 1977, Pat. No. 4,171,758. This application Mar. 26, 1979, Ser. No. 23,876
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—448

267,931
PENDANT WATCH
Jean-Claude Schwab, Savagnier, and Rene Bannwart, La Chaux de Fonds, both of Switzerland, assignors to Corum, Ries, Bannwart & Co., Switzerland
Filed Apr. 21, 1980, Ser. No. 141,799
Claims priority, application Switzerland, Oct. 22, 1979, 69476/79
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

267,932
PROTRACTOR
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405
Filed Jan. 26, 1981, Ser. No. 228,692
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65



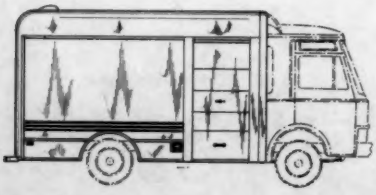
267,933
ROADWAY MARKER
Harold R. Luckinbill, Deerfield, Ill., assignor to Amerace Corporation, New York, N.Y.
Filed Jan. 30, 1981, Ser. No. 230,122
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113



267,934
DRAGON SCULPTURE
Jean W. Heap, Gwynedd, Wales, assignor to Pendelfin Studios Limited, Lancashire, England
Filed Feb. 19, 1981, Ser. No. 235,779
Claims priority, application United Kingdom, Aug. 19, 1980, 80/996199
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

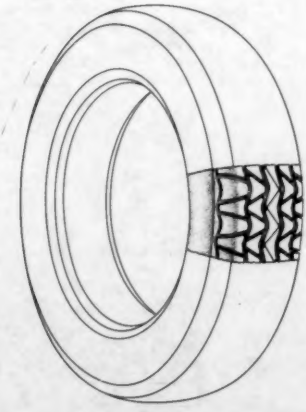
267,935
FIRE TRUCK CREW CAB
Frederick A. Robinett, and James M. Shook, both of San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.
Filed Sep. 23, 1980, Ser. No. 189,876
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—13

267,936
VEHICULAR VAN BODY
Walter D. Jannell; Howard N. McIntosh, both of Cumberland, and Edward J. O'Bar, Harrisville, all of R.I., assignors to Jannell & Son Body Company, Woonsocket, R.I.
Filed Dec. 29, 1980, Ser. No. 220,987
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—96



267,937
MOTOR VEHICLE TRAILER
John R. Conroy, Highland, Wis. 53543, and Russell A. Mayne, Blue River, Wis. 53518
Filed Sep. 25, 1980, Ser. No. 190,556
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

267,938
TIRE
Philippe Grenie, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Dec. 22, 1980, Ser. No. 218,690
Claims priority, application France, Jun. 26, 1980, 8033
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

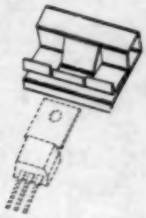


267,939
WINDSHIELD WIPER
Pierre G. Duvoux, Ballainvilliers, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France
Filed Aug. 13, 1980, Ser. No. 177,714
Claims priority, application France, Feb. 19, 1980, 800407
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

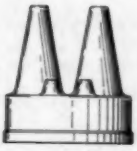
267,940
WINDSHIELD WIPER
Pierre G. Duvoux, Ballainvilliers, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France
Filed Aug. 13, 1980, Ser. No. 177,716
Claims priority, application France, Feb. 19, 1980, 800407
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

267,941
AUTOMOTIVE WHEEL
Charles W. Lombard, 1116 Belle Meadows Way, Salt Lake City, Utah 84121
Filed Jan. 12, 1981, Ser. No. 224,214
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

267,942
HEAT-SINK FOR ELECTRONIC SEMICONDUCTOR DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Nov. 21, 1980, Ser. No. 208,924
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

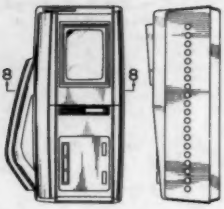


267,943
CONICAL DOUBLE END CAP FOR USE WITH A CABLE SPLICE CASE
William J. Seim, Roseville, and Ronald C. Houts, Vadnais Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 17, 1980, Ser. No. 207,254
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

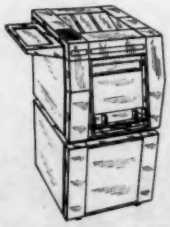


267,944
CONTROL PANEL
Constantine Vintzel, Brighton, and George H. McDaniel, Northville, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.
Filed Mar. 2, 1981, Ser. No. 239,290
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35

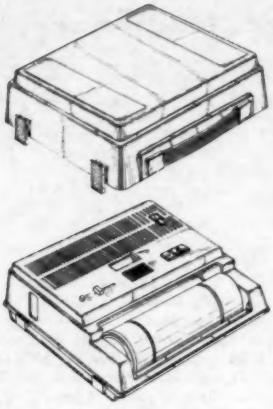
267,945
VIDEO TELEVISION RECEIVER
Osamu Sawaya, Tokyo, Japan, assignor to Nippon Interphone Co. Ltd., Tokyo, Japan
Filed Aug. 18, 1980, Ser. No. 179,267
Claims priority, application Japan, Feb. 22, 1980, 55-6552
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—54



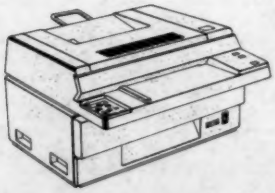
267,946
FACSIMILE TRANSCEIVER
Mikio Kosako, and Katsuhiro Ishida, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 18, 1980, Ser. No. 188,381
Claims priority, application Japan, Mar. 22, 1980, 55-11428
Term of patent 14 years
Int. Cl. D14—*01, 02, 03*
U.S. Cl. D14—94



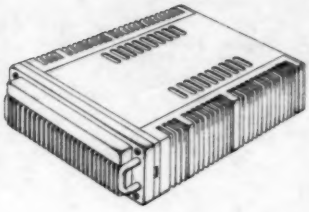
267,947
PORTABLE FACSIMILE TRANSMITTER
Bernd Helling, Old Bridge; Michael S. Zarro, Lakewood, and David G. Rutherford, Marlboro, all of N.J., assignors to The Associated Press, East Brunswick, N.J.
Filed Jan. 22, 1981, Ser. No. 227,543
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—94



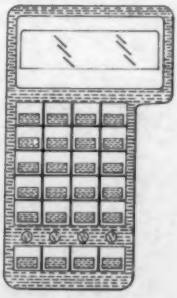
267,948
FACSIMILE TRANSMITTER AND RECEIVER
Fumiyo Kojima, Hiratsuka, and Manzo Yoshihama, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 11, 1981, Ser. No. 233,400
Claims priority, application Japan, Aug. 11, 1980, 55-032812
Term of patent 7 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—94



267,949
AMPLIFIER FOR AUTOMOBILE
Toshiyuki Hisatsune, Soka, Japan, assignor to Clarion Co. Ltd., Tokyo, Japan
Filed Nov. 1, 1979, Ser. No. 90,454
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96

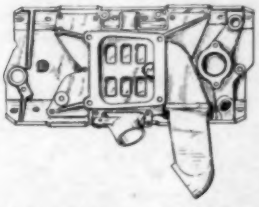


267,950
FRONT PANEL FOR A KEYBOARD AND DISPLAY UNIT
Charles M. Ault, Winchester, Mass., assignor to Termiflex Corporation, Nashua, N.H.
Filed Sep. 5, 1980, Ser. No. 184,627
Term of patent 14 years
Int. Cl. D14—*02*; D18—*01*
U.S. Cl. D14—115



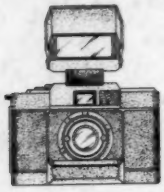
267,951
WIND TURBINE SYSTEM
Otto J. M. Smith, 612 Euclid Ave., Berkeley, Calif. 94708
Filed Oct. 6, 1980, Ser. No. 194,037
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—1

267,952
LOW-PROFILE INTAKE MANIFOLD
James W. Martin, 17421 E. Gale Ave., City of Industry, Calif. 91745
Filed Oct. 22, 1979, Ser. No. 87,457
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—5



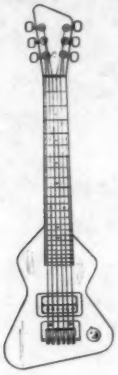
267,953
POWERED SNOW THROWER
John M. Berner, 1300 Angelo Dr., Golden Valley, Minn. 55422
Filed Mar. 27, 1979, Ser. No. 24,309
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D15—12

267,954
COMBINED CAMERA/FLASH UNIT
Kenji Sawara, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan
Filed Jan. 19, 1981, Ser. No. 228,361
Claims priority, application Japan, Jul. 20, 1980, 55-29190
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—6

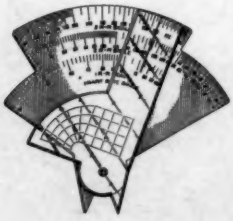


267,955
SINGLE LENS REFLEX CAMERA
Takaharu Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 11, 1981, Ser. No. 233,669
Claims priority, application Japan, Aug. 11, 1980, 55-032813
Term of patent 7 years
Int. Cl. D16—*01*
U.S. Cl. D16—8

267,956
GUITAR
Mark Erlewine, 1605 Wethersfield Rd., Austin, Tex. 78703, and William F. Gibbons, 5459 Bordley, Houston, Tex. 77056
Filed Sep. 18, 1980, Ser. No. 188,605
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

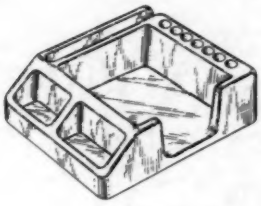


267,957
ELECTROCARDIOGRAM ANALYZER
Frank W. Jackson, Twillingate, R.D. 3, Mechanicsburg, Pa. 17055
Filed May 26, 1978, Ser. No. 910,121
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—9

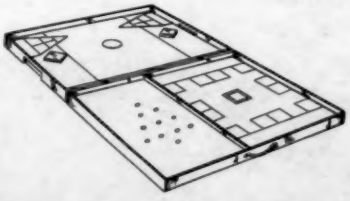


267,958
PLANISPHERE
Tetsuro Watanabe, Tokyo, Japan, assignor to Watanabe Kyogu Co., Ltd., Tokyo, Japan
Filed Nov. 21, 1980, Ser. No. 209,025
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—61

267,959
HOLDER FOR LETTERS, WRITING INSTRUMENTS, NOTE PAD AND OTHER STATIONERY ARTICLES
Kwok T. Cheung, 7 Cheung Lee St., 6/F, Flat C, Man Foong Ind. Building, Chaiwan, Hong Kong
Filed Dec. 15, 1980, Ser. No. 216,204
Claims priority, application United Kingdom, Jun. 26, 1980, 995465
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—78

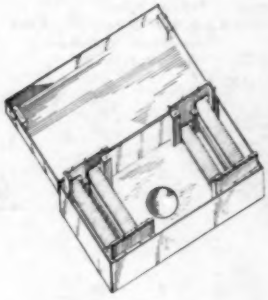


267,960
GAME BOARD
John S. Moore, 129 Quonnipaug La., Guilford, Conn. 06437
Filed Sep. 22, 1980, Ser. No. 189,789
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15



267,961
RANDOM NUMBER DIE
Matti V. Bjon, Louhentie 7 A 4, SF-02130 Espoo 13, Finland
Filed Dec. 31, 1979, Ser. No. 108,529
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41

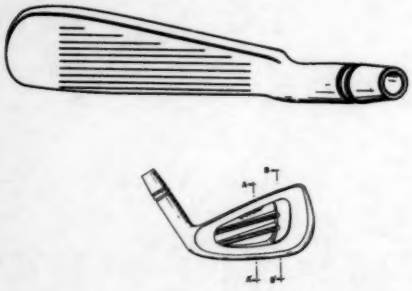
267,962
COMBINED GAME AND CARRYING CASE
Pham P. Oanh, Hohenzollernstrasse 97, Munich 40, Fed. Rep. of Germany
Filed Jan. 21, 1980, Ser. No. 113,611
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—55



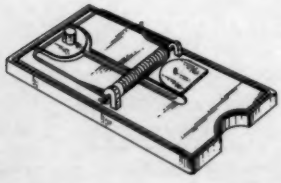
267,963
GAME DEVICE
Anne T. Alwell, St. Paul, Minn.; A. Edward Fogarty; Bonnie R. Fogarty, both of Sarasota, Fla.; David A. Pagani, Newport Beach, Calif., and Peter D. Pook, Minneapolis, Minn., assignors to Leisure Dynamics, Inc., Minneapolis, Minn.
Filed Oct. 24, 1980, Ser. No. 200,532
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—168

267,964
RABBIT FIGURE
Margaret K. Gibbons, 418 Walker St., Lowell, Mass. 01851
Filed Feb. 17, 1981, Ser. No. 235,165
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—187

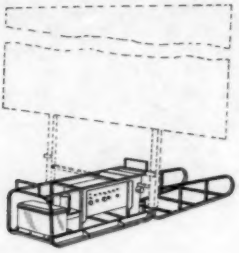
267,965
IRON CLUB HEAD
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 6, 1979, Ser. No. 55,485
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220



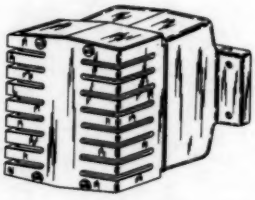
267,966
ANIMAL TRAP
Phillip Dushey, 2220 Avenue J, Brooklyn, N.Y. 11210
Filed Nov. 28, 1980, Ser. No. 211,277
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



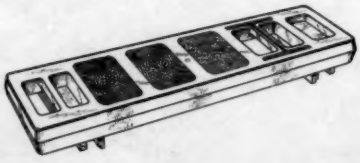
267,967
LIGHT DUTY TARGET MECHANISM
Brian H. Meredith, Corfham, England, assignor to Australasian Training Aids (Pty.) Ltd., Albury, Australia
Filed Sep. 10, 1980, Ser. No. 185,791
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—99



267,968
MUFFLER FOR A VALVE
Earl Beach, Royal Oak, and Calvin Matle, Farmington, both of Mich., assignors to Ross Operating Valve Company, Detroit, Mich.
Filed Sep. 30, 1980, Ser. No. 192,313
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1

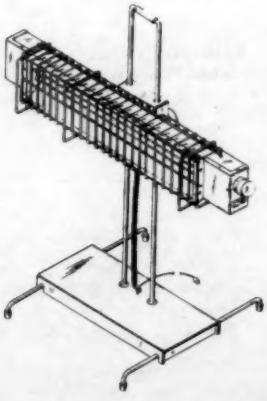


267,969
BATH SEAT
Michael Rodger, Loughborough, England, assignor to Gordon Ellis and Company, Derby, England
Filed Dec. 11, 1980, Ser. No. 215,483
Claims priority, application United Kingdom, Jun. 12, 1980, 995264
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D23—71

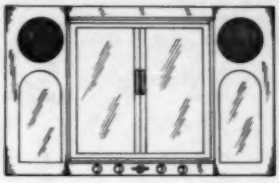


267,970
RADIANT HEATER
Jerry P. Gronwick, Park Ridge, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 22, 1980, Ser. No. 219,178
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—120

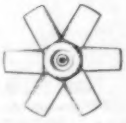
267,971
HEATER
Marc Harrison, Portsmouth, R.I., assignor to Quartzpower, Inc., Great Neck, N.Y.
Filed Jul. 14, 1980, Ser. No. 168,564
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—123



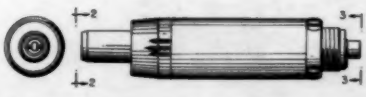
267,972
FIREPLACE CLOSURE DEVICE
Robert J. Schockemoehl, and David K. Lingwall, both of Des Moines, Iowa, assignors to R. J. Custom Firescreen, Incorporated, Des Moines, Iowa
Filed Aug. 8, 1980, Ser. No. 176,400
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—128



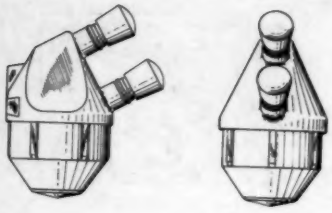
267,973
ELECTRIC FAN FOR ENGINE COOLING
Roger Clemente, 1789 Vauxhill Rd., Union, N.J. 07083
Filed Sep. 25, 1980, Ser. No. 190,938
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—158



267,974
DENTAL HANDPIECE MOTOR
John D. Nilles, Roselle; Stanley L. Stankiewicz, Chicago, and David S. Zabriski, Mount Prospect, all of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Jun. 23, 1980, Ser. No. 161,683
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

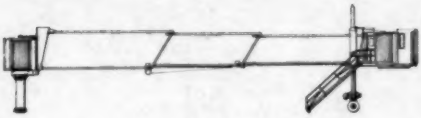


267,975
NEBULIZER CUP
Edward van Amerongen, Wilmette; Frank Cammarata, III, Palatine, and Robert A. Virag, Cary, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Aug. 20, 1980, Ser. No. 179,721
Term of patent 14 years
Int. Cl. D9—*01;* D24—*01*
U.S. Cl. D24—62

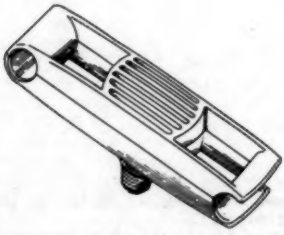


267,976
ARM-SLING
Claire W. Hammer, 415 Homeland Ave., Baltimore, Md. 21212, and Clara Z. Wernig, 7605 Knollwood Rd., Towson, Md. 21204
Continuation-in-part of Ser. No. 149,730, May 14, 1980, abandoned. This application Apr. 10, 1981, Ser. No. 253,165
Term of patent 14 years
Int. Cl. 24—*04*
U.S. Cl. D24—64

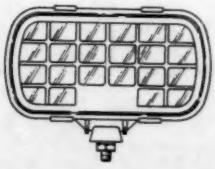
267,977
PASSENGER CONVEYANCE LOADER FOR AIRPORTS
Otto Droad, Hialeah, Fla., assignor to Wollard Aircraft Equipment, Inc., Miami, Fla.
Filed Dec. 11, 1980, Ser. No. 215,324
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—1



267,978
FLUORESCENT CIRCULAR LAMP ADAPTER
Jack V. Miller, 1977 E. Villa St., Pasadena, Calif. 91107
Filed Jun. 24, 1980, Ser. No. 162,519
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—26



267,979
LAMP FOR A VEHICLE
Bernard Mauroy, Champs, France, assignor to Ducellier & CIE, Creteil, France
Filed Jun. 16, 1980, Ser. No. 159,696
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28

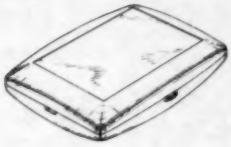


267,980
COMBINATION UTILITY AND POCKETBOOK LIGHT
Edward Gibstein, and Jeffrey Nortman, both of New York, N.Y., assignors to Jedco Products Ltd., New York, N.Y.
Filed Oct. 6, 1980, Ser. No. 194,414
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37

267,981
ELECTRIC CANDLESTICK OR THE LIKE
Fred W. Montague, Jr., 518 E. Franklin St., Raleigh, N.C. 27604
Filed Dec. 22, 1980, Ser. No. 218,665
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—96

267,982
POCKET DISPENSER FOR PERFUME AND THE LIKE
Donald J. Kennedy, 30 W. 443 Fairway Dr., Naperville, Ill. 60540
Filed Nov. 17, 1980, Ser. No. 207,921
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—5

267,983
VANITY MIRROR INCORPORATING ILLUMINATED SURROUND
Kwok K. Cheung, Chi Wah Industrial Bldg., 1-7, Kin Hon St., Block C, 9/F, Kwai Chung, N.T., Hong Kong, assignor to Kwok Kee Cheung; King Sing Tong and Wing Kui Tong, all of Kwai Chung, Hong Kong
Filed Feb. 11, 1981, Ser. No. 233,644
Claims priority, application United Kingdom, Dec. 3, 1980, 997859
Term of patent 3½ years
Int. Cl. D28—*03*
U.S. Cl. D28—67



267,984
STICK FOR THE APPLICATION OF COSMETICS
Pierre Ballereaud, 4 bis, route d'Ormoy, 28360 Dammarie, France
Filed Feb. 10, 1981, Ser. No. 233,184
Claims priority, application Switzerland, Aug. 12, 1980, 70.575
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D28—89

267,985

DISPOSABLE FACE MASK

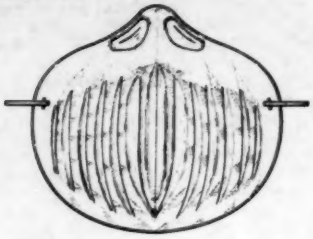
Otto L. Huber, Beverly Hills, Calif., assignor to Moldex/Metric Products, Inc., Culver City, Calif.

Filed Sep. 24, 1980, Ser. No. 190,460

Term of patent 14 years

Int. Cl. D29—*02;* D24—*99*

U.S. Cl. D29—08



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF FEBRUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.M.S. Corporation: *See*—
Starck, William R., 4,373,295, Cl. 49-435.000.

A/S Tele-Plan: *See*—
Holmen, Hans K., 4,373,332, Cl. 60-426.000.

AA Wire Products Company: *See*—
Allan, Jack A., 4,373,314, Cl. 52-434.000.

Abbott Laboratories: *See*—
Mowles, Donald L.; Middaugh, James F.; Rutnarak, Sangvorn; and Genese, Joseph N., 4,373,559, Cl. 141-18.000.

Abel, Cora: *See*—
Abel, Jack; and Abel, Cora, 4,373,279, Cl. 40-155.000.

Abel, Jack; and Abel, Cora. Frame straightening and supporting device. 4,373,279, Cl. 40-155.000.

Abel, William A.: *See*—
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Abernathy, Marshall W.; and Bailey, Darrell E., to Coaden Technology, Inc. Method for controlling the formation of polymer accumulations during distillation of a vinylaromatic monomer. 4,374,000, Cl. 203-9.000.

Adachi, Hirosi: *See*—
Kawano, Yoshihiko; Adachi, Hirosi; Watanuki, Masakazu; and Ueno, Takashi, 4,373,679, Cl. 241-275.000.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic booster. 4,373,424, Cl. 91-20.000.

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Adams, Karen M.: *See*—
Gandhi, Haren S.; and Adams, Karen M., 4,374,103, Cl. 423-213.500.

Adams, Norman H.; and Campbell, David N., to Hymatic Engineering Company Limited, The. Cryogenic cooling apparatus. 4,373,357, Cl. 62-514.0JT.

Adham, Jawad F., to International Business Machines Corporation. Connector implemented with fiber optic means and site therein for integrated circuit chips. 4,373,778, Cl. 350-96.200.

Adkins, Richard C., to Rolls-Royce Limited. Gas turbine engine combustion chambers. 4,373,327, Cl. 60-39.370.

Adler, Franklin P.; and Nadherny, Rudolph E., to Illinois Railway Equipment Company. Quick release load securing device. 4,373,841, Cl. 410-34.000.

Adlerstein, Michael G., to Raytheon Company. Method of making semiconductor device having improved Schottky-barrier junction. 4,374,012, Cl. 204-192.0SP.

Adolph, Horst G., to United States of America, Navy. Nitropolyformals. 4,374,241, Cl. 528-266.000.

Adsley, Ian: *See*—
Wykes, John S.; and Adsley, Ian, 4,374,326, Cl. 250-255.000.

Aertken, Karl: *See*—
Westernacher, Helmut; and Aertken, Karl, 4,373,999, Cl. 203-6.000.

AES Technology Systems, Inc.: *See*—
Bishop, Cliff, 4,373,848, Cl. 414-403.000.

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Gouesbet, Gerard, 4,373,807, Cl. 356-28.500.

Agius, Frank P. Coded key cutting device. 4,373,414, Cl. 83-414.000.

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Wunning, Joachim, 4,373,903, Cl. 431-215.000.

Aichinger, Wilhelm: *See*—
Bitzer, Eberhard; Aichinger, Wilhelm; and Steinhilber, Gerhard, 4,374,006, Cl. 204-43.00G.

Aihara, Mamoru: *See*—
Matsuura, Tsuyoshi; Fujiwara, Hiroshi; Aihara, Mamoru; Takahashi, Yutaka; and Nakajima, Yoshio, 4,373,796, Cl. 354-173.000.

Air Products and Chemicals, Inc.: *See*—
Tao, John C. C., 4,374,018, Cl. 208-112.000.
Tarrer, Arthur R.; and Shridharani, Ketan G., 4,374,016, Cl. 208-10.000.

Air Resources, Inc.: *See*—
Primack, Harold S., 4,374,104, Cl. 423-226.000.

Airco, Inc.: *See*—
Hinn, John S., 4,373,344, Cl. 62-62.000.

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Adachi, Yoshiharu, 4,373,424, Cl. 91-20.000.
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Kondo, Toshio, 4,373,616, Cl. 188-73.450.

Akagi, Akio: *See*—
Uenishi, Toshiaki; Harada, Hidefumi; Sasaki, Katumasa; Akagi, Akio; and Yamasaki, Takanori, 4,373,963, Cl. 106-304.000.

Akagi, Motonobu: *See*—
Ito, Shoji; and Akagi, Motonobu, 4,373,552, Cl. 137-625.480.

Akita, Sigeyuki: *See*—
Kitamura, Sotoo; Akita, Sigeyuki; and Kitagawa, Junji, 4,373,388, Cl. 73-301.000.

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Grundler, Robert; Fuchs, Josef; and Jenni, Herbert, 4,373,557, Cl. 139-142.000.

Akzo n.v.: *See*—
Wieringa, Johannes H., 4,374,133, Cl. 424-244.000.

Akzona Incorporated: *See*—
Gribnau, Thomas C. J.; Roeles, Frits; and Leuvering, Johannes H. W., 4,373,932, Cl. 436-501.000.
Ulin, Roy A.; Foley, Ted; and Shah, Hasmukh, 4,373,629, Cl. 206-350.000.

Alberta Research Council: *See*—
Chen, Shi-Chow; and MacTaggart, John M., 4,374,069, Cl. 260-465.400.

Albertsen, Peter S.: *See*—
Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., 4,373,507, Cl. 126-289.000.

Albright, Jay D.: *See*—
Moran, Daniel B.; and Albright, Jay D., 4,374,249, Cl. 548-201.000.

Albrile, Walter, to Ing. C. Olivetti & C. S.p.A. Ribbon guide for an inked ribbon cartridge. 4,373,823, Cl. 400-196.100.

Alderson, Loren L.: *See*—
Martin, Robert J.; Alderson, Loren L.; and Carlin, Jerry F., 4,373,869, Cl. 417-213.000.

Alexander, David G.; and Woolley, Ian J., to Simon-Rosedowns Limited. Apparatus for the expansion of oil bearing seeds. 4,373,434, Cl. 100-43.000.

Alexandria Extrusion Company: *See*—
Pennertz, Donald W.; and Burkey, Ritchie J., 4,373,297, Cl. 51-84.00R.

Alexandrov, Sasho P.; Mubarakshin, Gadyshha M.; Volf, Leonard A.; and Burinsky, Stanislav V., to Leningradsky Ordena Trudovogo Krasnogo Znameni Institut Textilnoi I Legkoi Promyshlennosti Imeni S.M. Kirova. Porous open-cell filled reactive material containing a polymeric matrix and reactive filler. 4,374,204, Cl. 521-28.000.

Alfa-Laval AB: *See*—
Jernqvist, Ake; and Bolmstedt, Ulf, 4,373,579, Cl. 165-167.000.

Algieri, Aldo A.: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,374,248, Cl. 548-135.000.

Allan, Jack A., to AA Wire Products Company. Masonry veneer wall anchor. 4,373,314, Cl. 52-434.000.

Allan, John L. H.; Finestone, Arnold B.; and Roderick, John J., to El Paso Polyolefins Company. Stabilized polyolefin compositions. 4,374,230, Cl. 525-134.000.

Allen, Beverly J., to Oscar Lucks Company. Humidifier for a proof box. 4,373,430, Cl. 99-468.000.

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Allibert Exploitation: *See*—
Rech, Jacques, 4,373,306, Cl. 52-98.000.

Allied Corporation: *See*—
Lefrancois, Philip A., 4,374,111, Cl. 423-347.000.
Mathe, Istvan; and Kasper, Alan H., 4,373,769, Cl. 339-97.00R.
Van Der Puy, Michael; and Piskorz, Ronald F., 4,374,289, Cl. 570-168.000.

Allis-Chalmers Corporation: *See*—
Goldman, Holliday L., 4,373,242, Cl. 29-157.10R.
Petit, Peter J.; and Hartwig, Walter J., 4,373,908, Cl. 432-109.000.
Petit, Peter J.; and Gill, Thomas J., 4,373,909, Cl. 432-109.000.

Allori, Aldo; Koutsky, Ronald A.; and Wilger, John A., to International Harvester Co. Probe mount assembly for brake wear warning systems. 4,374,375, Cl. 340-52.00A.

Aluminum Company of America: *See*—
Ray, Siba P., 4,374,050, Cl. 252-519.000.

AM International, Inc.: *See*—
Hur, John Y., 4,374,190, Cl. 430-19.000.

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Lussiez, Guy W.; and Jha, Mahesh C., 4,374,101, Cl. 423-150.000.
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Amchem Products, Inc.: *See*—
Hess, Susan V., 4,373,968, Cl. 148-6.200.

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Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,373,370, Cl. 72-349.000.

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Blank, Werner J., 4,374,164, Cl. 427-385.500.
Johnson, Melvin C., 4,374,135, Cl. 424-251.000.

Moran, Daniel B.; and Albright, Jay D., 4,374,249, Cl. 548-201.000.
Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., 4,374,107, Cl. 423-265.000.

American Motors Corporation: *See*—
Lunn, Royston C.; MacAfee, J. Edwin; Grabowski, Robert C.; Renneker, Dennis N.; and Winkler, John M., 4,373,604, Cl. 180-247.000.

American Newspaper Publishers Association: *See*—
Matalia, Harshad D.; and Navi, Menashe, 4,373,443, Cl. 101-221.000.

AMP Incorporated: *See*—
Long, Alden O., Jr., 4,373,261, Cl. 29-861.000.

Analog Devices, Inc.: *See*—
Deacutis, James J., 4,374,314, Cl. 219-121.0LJ.

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Anderson, George W.: *See*—
Mahaffy, Reid A.; and Anderson, George W., 4,373,341, Cl. 60-721.000.

Anderson, Gerald L.; Borders, Harley A.; and Aquino, Maria R., to Institute of Gas Technology. Purification of fuel gases. 4,374,105, Cl. 423-230.000.

Anderson, James K.: *See*—
Massey, Lester G.; Brabets, Robert I.; Abel, William A.; Anderson, James K.; Labus, Thomas J.; and George, Davis A., 4,373,864, Cl. 417-46.000.

Anderson, William C.: *See*—
Wolters, Richard H.; Anderson, William C.; Tyke, Charles R.; and Schreiner, Charles P., 4,373,642, Cl. 220-72.000.

Andonian, Harry A.; and Dickinson, Warren A., Jr., to SCM Corporation. Process for controlling the pinking of onions. 4,374,153, Cl. 426-321.000.

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Anisimov, Veniamin M.; Belov, Valentin V.; Verkevich, Vsevolod I.; and Orionov, Jury E. Shutoff valve actuator remote control system. 4,373,698, Cl. 251-26.000.

Anschutz & Co. GmbH: *See*—
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Antos, George J., to UOP Inc. Hydrocarbon dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,374,046, Cl. 252-466.00B.

Anzai, Masayasu: *See*—
Mukoh, Akio; Morishita, Hirosada; Anzai, Masayasu; Tokunaga, Kazuyoshi; and Kikuchi, Yasuo, 4,374,191, Cl. 430-100.000.

Anzalone, Carmen J., to Fedders Corporation. Refrigerant control. 4,373,353, Cl. 62-200.000.

Aoki, Kiyoshi; and Ohara, Saburo, to Kanebo, Ltd.; and Kanebo Synthetic Fibers Ltd. Modifier for fibers or fibrous structures and modified fibers or fibrous structures. 4,374,176, Cl. 428-392.000.

Aoki, Takaaki: *See*—
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Applied Magnetics Corporation: *See*—
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Aquino, Maria R.: *See*—
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Arai, Kenichiro, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Dot printer. 4,373,438, Cl. 101-93.040.

Arai, Kozo: *See*—
Shingu, Hideo; Arai, Kozo; and Ootsuka, Ryotatsu, 4,373,950, Cl. 75-68.00R.

Araki, Kunihiko, to Ricoh Company, Ltd. Focusing position detection apparatus. 4,373,791, Cl. 354-25.000.

Arbique, Roland H., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence. Respirator speech unit/outlet valve. 4,373,520, Cl. 128-201.190.

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Blegen, James R., 4,374,167, Cl. 428-141.000.
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Shekel, Joseph; and DeStefano, Joseph, 4,373,762, Cl. 339-31.00B.
Shekel, Joseph; and DeStefano, Joseph, 4,373,763, Cl. 339-31.00B.

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Bajard, Jean, to Societe Alsacienne de Services Industriels. Arrangement for measuring the amount of gas enclosed in a liquid. 4,373,374, Cl. 73-19.000.

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Silberman, Raphael J.; Tilton, Frederick T.; Smith, Everett H.; and Wichkoski, Dennis A., 4,373,584, Cl. 166-117.700.

Bakker, Gijsbertus; and Groot, Theodorus C., to U.S. Philips Corporation. Method of manufacturing a color television display tube. 4,373,237, Cl. 445-3.000.

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Hooker, Donald E.; and Tojza, Roman A., 4,373,727, Cl. 273-143.00R.

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Muller, Josef, 4,373,257, Cl. 29-736.000.

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Banks, Edward L., to Western Electric Company, Inc. Methods and apparatus for polishing a semiconductor wafer. 4,373,991, Cl. 156-645.000.

Barajas, Felix, to McDonnell Douglas Corporation. Solder composition. 4,373,974, Cl. 148-24.000.

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Parnum, John D.; and Barber, Nigel T., 4,373,301, Cl. 51-281.00C.

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Barnett, Eugene J., to White Consolidated Industries, Inc. Motorized oven door latch and control circuit for same. 4,374,320, Cl. 219-413.000.

Barney, John H., to Tosco Corporation. Heat flux control technique. 4,374,017, Cl. 208-11.00R.

Barr, Thomas R. Rotary drill bit. 4,373,594, Cl. 175-393.000.

Barrera, Marion; and Godfrey, Raymond. Crushing method and apparatus. 4,373,674, Cl. 241-15.000.

Barrett, Gary L., to GSE, Inc. Method and apparatus for measuring cable tension in a parking brake assembly. 4,373,402, Cl. 73-862.390.

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Bartholic, David B., to Engelhard Minerals & Chemicals Corporation. Method for controlling a pretreatment process. 4,374,021, Cl. 208-251.00R.

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Eicken, Karl; and Wuerzer, Bruno, 4,373,945, Cl. 71-92.000.
Heilen, Gerd; Halbritter, Klaus; and Gramlich, Walter, 4,374,274, Cl. 568-313.000.
Horner, Michael; and Teege, Gernot, 4,374,258, Cl. 549-407.000.

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Baumoel, Joseph. Transducer structure and mounting arrangement for transducer structure for clamp-on ultrasonic flowmeters. 4,373,401, Cl. 73-861.180.

Bauser, Elisabeth; Frik, Martina; Lochner, Karl S.; and Schmidt, Laurenz, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method of growing epitaxial layers from a liquid phase. 4,373,988, Cl. 156-622.000.

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Horler, Hansulrich; and Meier, Erwin, 4,373,336, Cl. 60-606.000.

Beasley, John K.; and Urban, Edward J., to Du Pont de Nemours, E. I., and Company. Tree-resistant ethylene polymer compositions containing aromatic polycarboxylic acid. 4,374,224, Cl. 524-298.000.

Beaudette, Jerald G. Cleat device. 4,373,463, Cl. 114-218.000.

Becka, Michael M., to International Shoe Machine Corporation. Machine for applying a patch of adhesive onto the bottom of a last. 4,373,467, Cl. 118-211.000.

Becker, Andrew R., to Koppers Company, Inc. Filter bag tensioning device and method. 4,373,936, Cl. 55-97.000.

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Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., 4,373,384, Cl. 73-119.00A.

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Reid, Taylor A.; Miller, James A.; and Barber, Duane G., 4,373,813, Cl. 356-326.000.

Bedford, Raymond E.: *See*—
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Corbett, David F., 4,374,144, Cl. 424-274.000.
Luk, Kong; and Rogers, Norman H., 4,374,147, Cl. 424-283.000.

Behr-Thomson Dehnstoffregler GmbH: *See*—
Kurz, Manfred, 4,374,373, Cl. 337-383.000.

Beiden, Vladimir E.: *See*—
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Beisel, Victor A. Flail-vacuum seed harvester. 4,373,322, Cl. 56-126.000.

Belden Corporation: *See*—
Kincaid, John, 4,374,299, Cl. 174-36.000.

Belko, Robert P.: *See*—
Klemarczyk, Philip T.; Belko, Robert P.; and Boden, Richard M., 4,374,053, Cl. 252-522.00R.

Bell, Samuel W., Jr., to Marley Company. Reflex fan cylinder for water cooling towers. 4,374,072, Cl. 261-109.000.

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Camlibel, Irfan; Singh, Shobha; and Van Uitert, LeGrand G., 4,374,391, Cl. 357-17.000.
Flanagan, James L., 4,374,304, Cl. 179-15.55R.
Geyling, Franz T.; and Louzon, Theodore J., 4,374,161, Cl. 427-160.000.
Lee, Tien P., 4,374,390, Cl. 357-17.000.
Pitetti, Raymond C.; and Rutkiewicz, John, 4,374,159, Cl. 427-96.000.
Porter, Roy A., 4,373,990, Cl. 156-643.000.

Belletire, John L., to Pfizer Inc. Carboxylic acid therapeutic agents. 4,374,148, Cl. 424-317.000.

Beloglazov, Alexei V.; Beiden, Vladimir E.; Iordan, Georgy G.; Karneev, Vladimir M.; Papkov, Vladimir S.; Stuchebnikov, Vladimir M.; Khasikov, Viktor V.; and Surovikov, Mikhail V. Semiconductor strain gauge transducer. 4,373,399, Cl. 73-777.000.

Belov, Valentin V.: *See*—
Anisimov, Veniamin M.; Belov, Valentin V.; Verkevich, Vsevolod I.; and Orionov, Jury E., 4,373,698, Cl. 251-26.000.

Bendig, Lothar, to Filterwerk Mann & Hummel GmbH. Ventilation check valve for internal combustion engines. 4,373,499, Cl. 123-574.000.

Bendix Corporation, The: *See*—
Blakesley, Roland F., 4,373,262, Cl. 29-882.000.
Brown, Arthur K., 4,373,877, Cl. 418-2.000.
Eastman, James M., 4,373,858, Cl. 415-112.000.
Gaiser, Robert F., 4,373,465, Cl. 116-227.000.
O'Keefe, Patrick J., Jr.; and Weissler, Harold E., II, 4,374,422, Cl. 364-426.000.
Piscitelli, R. Amelia; Hemmer, Valentine J.; Fischer, Charles P.; and Shepler, Eric F., 4,373,773, Cl. 339-262.00R.
Runkle, Dean E., 4,373,614, Cl. 188-72.300.

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Bennett, Robert A. Child resistant type trigger actuated pump dispenser. 4,373,644, Cl. 222-153.000.

Benoist, Jacques: *See*—
Raux, Jacques; and Benoist, Jacques, 4,373,770, Cl. 339-113.00R.

Berger, Jurgen. Sump oil draining and collecting device. 4,373,561, Cl. 141-330.000.

Berger, Mitchell H.; Mayer, Walter P.; and Ward, Robert J., to Union Carbide Corporation. Silane-containing isocyanate-terminated polyurethane polymers. 4,374,237, Cl. 528-28.000.

Berger, Mitchell H.; Maresca, Louis M.; and Steiner, Ulrich A., to Union Carbide Corporation. Process for preparing polyarylates. 4,374,239, Cl. 528-176.000.

Bergh, Daniel D., to Canadian General Electric Company Limited. Cut-out fuse tube. 4,373,556, Cl. 138-140.000.

Berman, Mort, to Avalon Industries, Inc. Audio-visual, child-participating educational entertainment center. 4,373,918, Cl. 434-307.000.

Bernier, William E., to International Business Machines Corporation. Electrolytic printing. 4,374,001, Cl. 204-2.000.

Bernt, Jorgen O. Non-tangling chain link. 4,373,910, Cl. 432-118.000.

Bertozzi, Eugene R., to Thiokol Corporation. Bisdithiocarbamate esters of di-lower alkyl formals. 4,374,142, Cl. 424-270.000.

Bethke, George E., Jr.: *See*—
Bowles, Stephen W.; and Bethke, George E., Jr., 4,374,408, Cl. 364-200.000.

Bettini, John E.; and Nelson, John F., to Illinois Tool Works Inc. Plastic-headed fastener assembly. 4,373,842, Cl. 411-377.000.

Beukema, Duane M.: *See*—
Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,373,692, Cl. 248-162.100.

Bey, Philippe; Jung, Michel; Kolb, Michael; and Danzin, Charles, to Merrell Toraude et Compagnie. Substituted deoxyadenosine derivatives. 4,374,128, Cl. 424-180.000.

Bienvenu, Jacques; Carre, Claude; Tuong, Duc L.; and Verdier, Henri, to Compagnie Honeywell Bull. Method of and system using P and V instructions on semaphores for transferring data among processes in a multiprocessing system. 4,374,409, Cl. 364-200.000.

Bijen, Jan M. J. M.: *See*—
Bomers, Joseph J. P.; Ellis, David G.; Jansen, Johann J.; and Bijen, Jan M. J. M., 4,373,981, Cl. 156-164.000.

Bildstein, Carl R.; Heibein, Harry P.; and Mathews, Harlan P., to International Business Machines Corporation. Force-temperature stabilization of an electromagnetic device. 4,374,386, Cl. 346-75.000.

Biller, Cleveland J.; and Thorner, Benjamin C., to United States of America, Agriculture. Log handling machine. 4,373,853, Cl. 414-732.000.

Billingsley, Henry C.; and DuBois, Chester G., to Outboard Marine Corporation. Fuel system providing priming and automatic warm up. 4,373,479, Cl. 123-187.50R.

Bing, David H., to Center For Blood Research, Inc. Means and methods for purifying Clq. Clr and Cls. 4,374,061, Cl. 260-112.00R.

Bishop, Cliff, to AES Technology Systems, Inc. Method and apparatus for exposing contents of an opened envelope with gravity assist. 4,373,848, Cl. 414-403.000.

Bitzer, Eberhard; Aichinger, Wilhelm; and Steinhilber, Gerhard, to Degussa Aktiengesellschaft. Electrolytic bath for the deposition of high gloss white gold coatings. 4,374,006, Cl. 204-43.00G.

Black, Sivalls & Bryson: *See*—
Markus, Gerardus A., 4,373,899, Cl. 431-158.000.

Blake, Edward W.: *See*—
Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,373,370, Cl. 72-349.000.

Blakesley, Roland F., to Bendix Corporation, The. Electrical contact with locking device. 4,373,262, Cl. 29-882.000.

Blank, Werner J., to American Cyanamid Company. High solids polymer resin coating composition containing amino resin cross-linking agent. 4,374,164, Cl. 427-385.500.

Blau, Herbert, to Blau & Lapides, Inc. Resilient dome device. 4,373,464, Cl. 116-63.00R.

Blau & Lapides, Inc.: *See*—
Blau, Herbert, 4,373,464, Cl. 116-63.00R.

Blegen, James R., to Ashland Oil, Inc. Vapor permeation curable polyester resin coating compositions for flexible substrates. 4,374,167, Cl. 428-141.000.

Blegen, James R., to Ashland Oil, Inc. Vapor permeation curable coatings for reaction injection molded parts. 4,374,181, Cl. 428-423.300.

Blessom, Norman S.; Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Piezoelectric transducer mounting structure and associated techniques. 4,374,402, Cl. 360-104.000.

Blum, Patricia R.; and Nicholas, Mark L., to Standard Oil Company, The. Preparation of fluidizable vanadium phosphorus oxide catalysts using a mixed phosphorus source. 4,374,043, Cl. 252-435.000.

Blumenfeld, Martin A., to RCA Corporation. Method of fabricating buried contacts. 4,373,254, Cl. 29-578.000.

Board of Regents, University of Texas System: *See*—
Howell, John R.; and Peng, C. S. Patrick, 4,373,347, Cl. 62-112.000.

Bodart, Robert; and Werts, Jean-Pierre, to U.S. Philips Corporation. Arrangement for regenerating start-stop signals and dial pulses. 4,374,305, Cl. 179-16.0EA.

Boden, Ogden W. Device for gripping an elongated flexible element. 4,373,234, Cl. 24-191.000.

Boden, Richard M.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Novel branched chain ketones and the process for preparing same. 4,374,276, Cl. 568-398.000.

Boden, Richard M.; and Geiger, John H., Jr., to International Flavors & Fragrances Inc. Aliphatic C_{11} branched chain aldehydes and alcohols, process for preparing same and uses thereof in augmenting or enhancing the aroma of perfumes, colognes and/or perfumed articles. 4,374,277, Cl. 568-448.000.

Boden, Richard M.: *See*—
Klemarczyk, Philip T.; Belko, Robert P.; and Boden, Richard M., 4,374,053, Cl. 252-522.00R.

Boduch, Paul A.: *See*—
Stephan, James E.; Boduch, Paul A.; and Elverum, John A., 4,374,076, Cl. 264-19.000.

Boehling, Daniel E. Rotary piston mechanism. 4,373,484, Cl. 123-241.000.

Boero, Giancarlo: *See*—
Basile, Giampiero; Boero, Giancarlo; Ceresa, Emiliano M.; and Montino, Franco, 4,374,118, Cl. 423-607.000.

Boggs, Bruce E.: *See*—
Jones, Dennis A.; and Boggs, Bruce E., 4,373,958, Cl. 106-118.000.

Bohan, John E., Jr., to Honeywell Inc. Timer and control circuit. 4,373,898, Cl. 431-73.000.

Bollfrass, Charles A.; Landriault, Leonard S.; and McDonald, Patrick E., to Hydril Company. Threaded connector. 4,373,754, Cl. 285-334.000.

Bolmstedt, Ulf: *See*—
Jernqvist, Ake; and Bolmstedt, Ulf, 4,373,579, Cl. 165-167.000.

Bomers, Joseph J. P.; Ellis, David G.; Jansen, Johann J.; and Bijen, Jan M. J. M., to Plasticisers, Ltd. Process for the manufacture of objects from water-hardened material. 4,373,981, Cl. 156-164.000.

Bondoc, Alfredo A., to Tarkett AB. Non-asbestos flooring felt containing particulate inorganic filler, a mixture of fibers and a binder. 4,373,992, Cl. 162-145.000.

Bopst, John H., III. Angle-attachment stabilizing unit. 4,373,987, Cl. 156-574.000.

Borburgh, Jacques; Naefe, Gerhard; and Rost, Helmut, to Siemens Aktiengesellschaft. Apparatus for ultrasonic scanning. 4,373,395, Cl. 73-607.000.

Borders, Harley A.: *See*—
Anderson, Gerald L.; Borders, Harley A.; and Aquino, Maria R., 4,374,105, Cl. 423-230.000.

Borer, Werner: *See*—
Schepers, Bernhard; Nobbe, Volker; Schroder, Bernd; Borer, Werner; and Kuliack, Manfred, 4,374,119, Cl. 423-625.000.

Borgnaes, Dan: *See*—
Dunnavant, William R.; Field, Richard E.; and Borgnaes, Dan, 4,374,229, Cl. 525-28.000.

Bornmann, Hans: *See*—
Linden, Heinrich; Bornmann, Hans; Gress, Wolfgang; and Wegemund, Bernd, 4,373,964, Cl. 106-308.00Q.

Borsuk, Leslie M.; and Corrales, Patrick G., to International Telephone and Telegraph Corporation. Connector and cable assembly. 4,373,777, Cl. 350-96.200.

Bossu, Frank P., to Procter & Gamble Company, The. Accelerated release laundry bleach product. 4,374,035, Cl. 252-91.000.

Boswell, Bennie J.: *See*—
Schaaf, Wayne J.; and Boswell, Bennie J., 4,373,591, Cl. 172-328.000.

Bouchard, Andre C.: *See*—
Hall, Harold H., Jr.; Bouchard, Andre C.; Shaffer, John W.; and Gavenonis, Thomas L., 4,374,073, Cl. 264-3.00R.

Bouchard, James P.; and Farrell, John D., to Chicago Bridge & Iron Company. Lightweight insulating concrete. 4,373,955, Cl. 106-88.000.

Boutteville, Raymond; and Febvret, Thierry, to Intertechnique. Fluid pressure detection. 4,373,385, Cl. 73-146.500.

Bouwknegt, Albert; and Lauwerijssen, Petrus C., to U.S. Philips Corporation. Low pressure discharge lamp. 4,374,340, Cl. 313-220.000.

Bowen, Mack D.; and Purdy, Kenneth R. Pyrolysis system utilizing pyrolytic oil recycle. 4,373,995, Cl. 202-95.000.

Bowles, Stephen W.; and Bethke, George E., Jr., to Burroughs Corporation. Multi-pass system and method for source to source code translation. 4,374,408, Cl. 364-200.000.

Bowman, Edward: *See*—
Ibrahim, Fayez; and Bowman, Edward, 4,373,348, Cl. 62-115.000.

Boyd, Hugh, to Goodyear Aerospace Corporation. Resilient liner for particulate bulk cargo receptacles. 4,373,645, Cl. 222-203.000.

Bozon, Alfred; Lakatos, Eduard; Koberstein, Edgar; Pletka, Hans-Dieter; and Volker, Herbert, to Degussa Aktiengesellschaft. Process for application of a catalytically active coating containing platinum, palladium or rhodium or their mixtures to a carrier and product made by said process. 4,374,047, Cl. 252-472.000.

Brabets, Robert I.: *See*—
Massey, Lester G.; Brabets, Robert I.; Abel, William A.; Anderson, James K.; Labus, Thomas J.; and George, Davis A., 4,373,864, Cl. 417-46.000.

Bracker AG: *See*—
Holenstein, Ernst; and Ramseier, Paul, 4,373,247, Cl. 29-426.600.

Bradley, David J.; Gibbs, Dennis D.; Kostuch, Donald J.; and Martin, James S., to International Business Machines Corp. Method for using page addressing mechanism. 4,374,417, Cl. 364-200.000.

Bradshaw, Cyril E., to Eaton Corporation. Pressure transducer for exhaust gas recirculation system. 4,373,495, Cl. 123-568.000.

Bradshaw, James I., to Reliability, Inc. Burn-in chamber. 4,374,317, Cl. 219-385.000.

Brainerd, Robert A., Jr.; and Demasters, James J. Apparatus for weighing a patient on a stretcher. 4,373,595, Cl. 177-147.000.

Branham, William C.: *See*—
Garlapaty, Venkat R.; Hall, Michael J.; and Branham, William C., 4,373,427, Cl. 92-88.000.

Braxell, Nils. Device for the joining of components. 4,373,829, Cl. 403-267.000.

Breitweg, Werner: *See*—
Walter, Wolfgang; and Breitweg, Werner, 4,373,599, Cl. 180-148.000.

Brennan, Michael A.: *See*—
Stamp, Custis L., Jr.; Herzog, Rollie R.; and Brennan, Michael A., 4,373,351, Cl. 62-160.000.

Breslow, Jeffrey D.: *See*—
Hanson, Steven P.; and Breslow, Jeffrey D., 4,373,729, Cl. 273-153.00S.

Brevignon, Michele: *See*—
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, 4,373,774, Cl. 350-6.600.

Brickus, Romas A.: *See*—
Stein, Bernard; Keramaty, Hamid; and Brickus, Romas A., 4,373,812, Cl. 356-246.000.

Bridgestone Tire Co., Ltd.: *See*—
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,373,566, Cl. 152-353.00G.

Brigham, William D.: *See*—
Zwick, Eugene B.; Nguyen, Dung D.; Brigham, William D.; and Hoffman, Kenneth, 4,373,896, Cl. 431-9.000.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,374,248, Cl. 548-135.000.
Menard, Marcel; and Martel, Alain, 4,374,065, Cl. 260-245.20R.

British Petroleum Company Limited, The: *See*—
Hancock, Ronald D.; and Mackison, Robert, 4,374,263, Cl. 560-204.000.

British Steel Corporation: *See*—
Burgin, Sidney A.; and Latham, David J., 4,373,972, Cl. 148-12.00B.

Brookes, David J.: *See*—
Powderley, John; and Brookes, David J., 4,373,318, Cl. 53-540.000.

Brooks, Burton, to Chemithon Corporation, The. Method for producing powdered detergent containing alpha olefin sulfonate. 4,374,058, Cl. 252-556.000.

Brooks Instrument B.V.: *See*—
Schuddemat, Jacob P.; and Huijsing, Johan H., 4,373,386, Cl. 73-189.000.

Brouwer, Hendrik L.: *See*—
Wittkampf, Frederik H. M.; Mensink, Kornelis A.; and Brouwer, Hendrik L., 4,373,531, Cl. 128-419.0PG.

Brown, Arthur K., to Bendix Corporation, The. Pump with rotatable reservoir casing and index means. 4,373,877, Cl. 418-2.000.

Brown, Claude D.: *See*—
Edwards, Robert E.; McKee, Donald H.; and Brown, Claude D., 4,373,363, Cl. 69-28.000.

Brown, Colin J.: *See*—
Pullen, Geoffrey J.; Pemberton, John A.; and Brown, Colin J., 4,373,319, Cl. 53-573.000.

Brown, Gale R.: *See*—
Kaiser, William L.; and Brown, Gale R., 4,373,518, Cl. 128-92.0EB.

Brown, George E. R.; Helm, Arthur E.; and Keane, Stuart. Amusement apparatus. 4,373,723, Cl. 273-86.00B.

Brown, Leonard, to Crossley Machine Company, Inc. Hydraulic press assembly. 4,373,889, Cl. 425-150.000.

Brown, Robert J.; and Shepherd, Kenneth D., to Duriron Company, Inc., The. Fire resistant seat for flow control valve. 4,373,543, Cl. 137-74.000.

Browning, Jesse. Apparatus for mixing reclaimed and virgin powder for use in spray booths. 4,373,820, Cl. 366-101.000.

Bruce, Charles R., to Marathon Oil Company. Method and apparatus for measuring leaks in liquid storage vessels. 4,373,815, Cl. 356-358.000.

Bruecker, George B. Silo discharge chute. 4,373,623, Cl. 193-14.000.

Brule, Michael R., to Kerr-McGee Corporation. Process for the liquefaction of coal. 4,374,015, Cl. 208-8.0LE.

Brun, Nicole A. A., to Labiol S.A. Method of ascertaining the hydrating action of a product to be applied to the skin. 4,373,382, Cl. 73-53.000.

Brunswick Corporation: *See*—
Kyker, Robert A., 4,373,683, Cl. 242-84.21R.
Weed, Lyle E., 4,373,922, Cl. 440-89.000.

Brusky, Phyllis L.: *See*—
Daniel, Chelliah; and Brusky, Phyllis L., 4,374,268, Cl. 562-599.000.

Bryant, David R.; and Galley, Richard A., to Union Carbide Corporation. Hydroformylation catalyst reactivation. 4,374,278, Cl. 568-454.000.

Buchta, Ervin A., to FMC Corporation. Metal seal for a gate valve stem. 4,373,700, Cl. 251-214.000.

Buckman Laboratories, Inc.: *See*—
Fenyes, Joseph G. E.; and Pera, John D., 4,374,040, Cl. 252-389.00A.

Budzich, Tadeusz. Reciprocating controls of a hydraulically driven piston gas compressor. 4,373,865, Cl. 417-46.000.

Buente, Stephen M.; and Hillebrand, George A., to Eaton Corporation. Lash adjuster with plunger retainer. 4,373,477, Cl. 123-90.550.

Bunker Ramo Corporation: *See*—
Holt, Harley R., 4,373,372, Cl. 72-406.000.

Burchette, Robert L., Jr.: *See*—
Hutchinson, George M.; and Burchette, Robert L., Jr., 4,373,685, Cl. 242-118.600.

Burde, Hans-Jurgen H.: *See*—
Schwarz, Herwig J.; Burde, Hans-Jurgen H.; and Minet, Günter, 4,374,172, Cl. 428-308.400.

Burgin, Sidney A.; and Latham, David J., to British Steel Corporation. Production of nickel bar and rod. 4,373,972, Cl. 148-12.00B.

Burinsky, Stanislav V.: *See*—
Alexandrov, Sasho P.; Mubarakshin, Gadylsha M.; Volf, Leonard A.; and Burinsky, Stanislav V., 4,374,204, Cl. 521-28.000.

Burke, Ben G.: *See*—
Legg, Douglas J.; and Burke, Ben G., 4,374,095, Cl. 422-218.000.

Burkey, Ritchie J.: *See*—
Pennertz, Donald W.; and Burkey, Ritchie J., 4,373,297, Cl. 51-84.00R.

Burlage, Donald W.; and Houts, Ronald C. Digital equalizer for high speed communication channels. 4,374,426, Cl. 364-724.000.

Burrington, J. D.; Grasselli, R. K.; and Kartisek, C. T., to Standard Oil Co., The. Indene production from aromatic olefins. 4,374,293, Cl. 585-410.000.

Burroughs Corporation: *See*—
Blessom, Norman S.; Ragle, Herbert U.; and DeMoss, Dean, 4,374,402, Cl. 360-104.000.
Bowles, Stephen W.; and Bethke, George E., Jr., 4,374,408, Cl. 364-200.000.
Catiller, Robert D.; and Forbes, Brian K., 4,374,416, Cl. 364-200.000.
Catiller, Robert D.; and Forbes, Brian K., 4,374,418, Cl. 364-200.000.

Burroughs Wellcome Co.: *See*—
Phillips, Arthur P., 4,374,146, Cl. 424-282.000.

Burrowes, John Kenneth: *See*—
Farrant, Herbert H., 4,373,315, Cl. 52-522.000.

Burton Mechanical Contractors Inc.: *See*—
Foreman, Brian E.; and Grooms, John M., 4,373,838, Cl. 406-14.000.

Bury, Cecil T., to David Brown Tractors Ltd. Lubricating oil pump drive for an internal combustion engine. 4,373,483, Cl. 123-198.00C.

Buschbom, Floyd E.; and Hansen, Glen D., to Veda, Inc. Three wheel drive vehicle. 4,373,600, Cl. 180-212.000.

Buttner, Gunter; Domazer, Hans-Gunter; and Eggert, Horst, to Th. Goldschmidt AG. Process for the preparation of alloy powders which can be sintered and which are based on titanium. 4,373,947, Cl. 75-0.5BB.

Caber, Earl L.: *See*—
VanHoutte, Arthur C.; and Caber, Earl L., 4,373,246, Cl. 29-426.400.

Cabot Corporation: *See*—
Yates, Barrie J.; and Hurst, Ronald C., 4,374,113, Cl. 423-445.000.

Cain Food Industries, Inc.: *See*—
Harrell, Richard G.; Glover, Herman L.; and Cain, Gary L., 4,374,150, Cl. 426-19.000.

Cain, Gary L.: *See*—
Harrell, Richard G.; Glover, Herman L.; and Cain, Gary L., 4,374,150, Cl. 426-19.000.

Cairns, James L. Underwater coaxial connector. 4,373,767, Cl. 339-94.00C.

Cairo, Anthony C.: *See*—
Barker, Charles E.; Cairo, Anthony C.; Bauer, Frederick T.; and Jackson, Auzville, Jr., 4,373,664, Cl. 236-46.00R.

Calcasola, Richard W.: *See*—
Lach, Richard F.; and Calcasola, Richard W., 4,374,435, Cl. 370-13.000.

Caldwell, Robert E., to Fairchild Camera & Instrument. Method for manufacturing a semiconductor structure having reduced lateral spacing between buried regions. 4,373,252, Cl. 29-576.00B.

Camboulives, Andre A. M. L.; Debeneix, Pierre; Gendronneau, Claude V. L.; and Hugnet, Roger P., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.). Emergency aerosol lubrication device, particularly for airborne engines. 4,373,421, Cl. 184-6.400.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,373,587, Cl. 166-324.000.

Camisa, Raymond L., to RCA Corporation. Monolithic integrated circuit. 4,374,394, Cl. 357-81.000.

Camlibel, Irfan; Singh, Shobha; and Van Uitert, LeGrand G., to Bell Telephone Laboratories, Incorporated. Device fabrication procedure. 4,374,391, Cl. 357-17.000.

Campbell, David N.: *See*—
Adams, Norman H.; and Campbell, David N., 4,373,357, Cl. 62-514.0TT.

Campbell, Gene K., to United States of America, Energy. Pressure charged airlift pump. 4,373,867, Cl. 417-90.000.

Campbell, John R.: *See*—
Loucks, George R.; and Campbell, John R., 4,374,233, Cl. 525-394.000.

Campbell, Stephen W.; Cragg, Eric E.; Elwell, Michael J.; and Johnson, Raymond A., to Lucas Industries Limited. Electric storage battery. 4,374,188, Cl. 429-187.000.

Canada, Atomic Energy of, Limited: *See*—
Chuang, Karl T.; and Roett, Maurice F., 4,374,116, Cl. 423-580.000.

Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See*—
Arbique, Roland H., 4,373,520, Cl. 128-201.190.

Canadian General Electric Company Limited: *See*—
Bergh, Daniel D., 4,373,556, Cl. 138-140.000.
Mattuck, Morris; and Comte, Rheal, 4,373,555, Cl. 138-140.000.

Canadian Patents & Development Limited: *See*—
Russell, Leslie T., 4,373,305, Cl. 52-86.000.
Skeaff, James M.; Ritcey, Gordon M.; Haque, Kazi E.; and Lucas, Bernard H., 4,374,096, Cl. 423-9.000.
Vikis, Andreas C., 4,374,010, Cl. 204-157.10R.

Canale, Albert S.: *See*—
Canale, Ralph D.; Canale, Albert S.; and Papazian, Harry, 4,374,036, Cl. 252-135.000.

Canale, Michael A.: *See*—
Canale, Ralph D.; Canale, Albert S.; and Papazian, Harry (said Harry Papazian assors. to), 4,374,036, Cl. 252-135.000.

Canale, Ralph D.; Canale, Albert S.; and Papazian, Harry, to Canale, Michael A., by said Harry Papazian. Composition and concentrate useful for making a fountain solution for lithographic printing operations. 4,374,036, Cl. 252-135.000.

Cannon, Jack W.; Herrman, Bradley D.; and Ramirez, Ramiro, Jr., to International Business Machines Corporation. Information transfer system wherein bidirectional transfer is effected utilizing unidirectional bus in conjunction with key depression signal line. 4,374,429, Cl. 364-900.000.

Canon Denshi Kabushiki Kaisha: *See*—
Shimada, Fumio; and Sugiura, Yoji, 4,373,797, Cl. 354-234.000.

Canon Kabushiki Kaisha: *See*—
Eida, Tsuyoshi; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Ohta, Tokuya, 4,373,954, Cl. 106-20.000.
Kimura, Hiroyuki; and Yamada, Tateo, 4,373,795, Cl. 354-173.000.
Kuge, Tsukasa; Matsumoto, Toru; Watanabe, Tsuyoshi; and Tamura, Yasuyuki, 4,373,469, Cl. 118-652.000.
Shimada, Fumio; and Sugiura, Yoji, 4,373,797, Cl. 354-234.000.
Suda, Masashi; and Kanbe, Junichiro, 4,373,468, Cl. 118-658.000.
Tsukada, Shusei; and Kurosaki, Yasuhide, 4,373,798, Cl. 355-3.0DD.
Yamada, Yasuyuki, 4,373,786, Cl. 350-432.000.

Caputo, William R.; and Husson, Alan L., to Westinghouse Electric Corp. Elevator system. 4,373,612, Cl. 187-29.00R.

Cardarelli, Nathan F.; and Evans, William H., to Warner-Lambert Company. Film forming antimicrobial material. 4,374,126, Cl. 424-81.000.

Carl Strutz & Company, Inc.: *See*—
Rodenbaugh, Ralph L.; and Zwigert, John M., 4,373,437, Cl. 101-35.000.

Carlander, Lars E. Device for variable height adjustment of supports. 4,373,334, Cl. 60-594.000.

Carlin, Jerry F.: *See*—
Martin, Robert J.; Alderson, Loren L.; and Carlin, Jerry F., 4,373,869, Cl. 417-213.000.

Carlisle Corporation: *See*—
Wagner, Harry H., 4,374,059, Cl. 523-153.000.

Carlston, Richard L.: *See*—
Martellock, Arthur C.; Carlston, Richard L.; and Liang, Shwu-Jian, 4,374,212, Cl. 523-212.000.

Carre, Claude: *See*—
Bienvenu, Jacques; Carre, Claude; Tuong, Duc L.; and Verdier, Henri, 4,374,409, Cl. 364-200.000.

Carson Products Company: *See*—
de la Guardia, Mario J., 4,373,540, Cl. 424-89.000.

Carter, Vernon H. Method for generation of bio-gas. 4,374,199, Cl. 435-167.000.

Casale, Michael A.: *See*—
Nalepa, Roger A.; and Casale, Michael A., 4,373,549, Cl. 137-487.500.

Casio Computer Co., Ltd.: *See*—
Morishige, Morio, 4,373,821, Cl. 368-21.000.

Castoe, John H. Method for removing cam shaft sprocket. 4,373,240, Cl. 29-156.40R.

Caterpillar Tractor Co.: *See*—
Livesay, Richard E., 4,373,758, Cl. 305-22.000.
Phelps, Weldon L., 4,373,697, Cl. 251-129.000.

Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Linear sequencing microprocessor having word and byte handling. 4,374,416, Cl. 364-200.000.

Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Linear microsequencer unit cooperating with microprocessor system having dual modes. 4,374,418, Cl. 364-200.000.
Caullier, Jean-Claude: *See*—
Coustre, Andre; Elitzsch, Robert; and Caullier, Jean-Claude, 4,374,424, Cl. 364-497.000.
Cavallotti, Pietro L.: *See*—
Chen, Tu; and Cavallotti, Pietro L., 4,374,009, Cl. 204-129.100.
Cavitt, Stanley B., to Texaco Inc. Ethylene oxide production. 4,374,260, Cl. 549-534.000.
CBS Inc.: *See*—
Rhodes, Harold B.; and Woodyard, Steven J., 4,373,418, Cl. 84-404.000.
Wilson, Gregg; and Page, John F., 4,373,417, Cl. 84-1.160.
Celanese Corporation: *See*—
Dammann, Laurence G., 4,374,216, Cl. 524-35.000.
Kim, Sang N.; McMahon, Paul E.; Riggs, John P.; and Rhodes, John M., 4,374,114, Cl. 423-447.100.
McGinnis, James L.; and Concistori, Anthony B., 4,374,262, Cl. 560-56.000.
Cellitti, Raymond A.; and Halgren, John A., to International Harvester Co. Method of manufacture of high performance gears. 4,373,973, Cl. 148-12.400.
Center For Blood Research, Inc.: *See*—
Bing, David H., 4,374,061, Cl. 260-112.00R.
Central Glass Company, Limited: *See*—
Nakaso, Yasuji; Tanaka, Kyoji; and Kawamoto, Hiromi, 4,374,108, Cl. 423-301.000.
Century Mfg. Co.: *See*—
West, John C., 4,373,212, Cl. 2-8.000.
Ceprini, Mario Q.: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,374,057, Cl. 252-426.000.
Ceresa, Emiliano M.: *See*—
Basile, Giampiero; Boero, Giancarlo; Ceresa, Emiliano M.; and Montino, Franco, 4,374,118, Cl. 423-607.000.
Cessna Aircraft Company, The: *See*—
Martin, Robert J.; Alderson, Loren L.; and Carlin, Jerry F., 4,373,869, Cl. 417-213.000.
Chaloupka, Zdenek: *See*—
Mateja, Ludvik; and Chaloupka, Zdenek, 4,374,313, Cl. 219-69.00E.
Champion International Corporation: *See*—
Cornell, William F.; Vear, John P.; and Pascuzzi, E. Anthony, 4,373,659, Cl. 229-32.000.
Roccaforte, Harry I., 4,373,626, Cl. 206-45.140.
Chang, Kern K. N., to RCA Corporation. Thin kinescope and electron beam reflector therefor. 4,374,343, Cl. 313-422.000.
Chang, Paul: *See*—
Mayer, Edward F.; Diamond, Arthur S.; and Chang, Paul, 4,374,192, Cl. 430-108.000.
Charbonnet, Carl D. Panel transferring apparatus. 4,373,846, Cl. 414-331.000.
Chemetics International Ltd.: *See*—
Tiedemann, Herman H., 4,374,115, Cl. 423-474.000.
Chemetron Corporation: *See*—
White, Kenneth T.; and Roberts, Harold F., 4,373,588, Cl. 169-19.000.
Cheminaud, Jean C.: *See*—
Schapira, Joseph; Ruel, Jacques; Cheminaud, Jean C.; Sadlo, Robert; and Christian, Robert, 4,374,039, Cl. 252-384.000.
Chemithon Corporation, The: *See*—
Brooks, Burton, 4,374,058, Cl. 252-556.000.
Chen, Shi-Chow; and MacTaggart, John M., to Alberta Research Council. Process for the preparation of trans-3-formylbut-2-enenitrile. 4,374,069, Cl. 260-465.400.
Chen, Tu; and Cavallotti, Pietro L., to Xerox Corporation. Electrochemical post treatment of perpendicular magnetic recording media. 4,374,009, Cl. 204-129.100.
Cherry-Burrell Corporation: *See*—
Knappe, Herman E., 4,373,545, Cl. 137-240.000.
Chevron Research Company: *See*—
Davis, Bruce W., 4,374,023, Cl. 208-11.0LE.
Farnham, Robert A., 4,374,094, Cl. 422-218.000.
Legg, Douglas J.; and Burke, Ben G., 4,374,095, Cl. 422-218.000.
Chicago Bridge & Iron Company: *See*—
Bouchard, James P.; and Farrell, John D., 4,373,955, Cl. 106-88.000.
Child, James L., Jr.: *See*—
Fouss, James L.; Rosenbaum, Larry A.; and Child, James L., Jr., 4,374,079, Cl. 264-46.100.
Chivas Products, Limited: *See*—
Moore, Ronald D., 4,373,229, Cl. 16-125.000.
Chou, Martin S. Gas flow safety control device. 4,373,548, Cl. 137-460.000.
Chow, Philip Y.: *See*—
Lin, Tung-Yen; and Chow, Philip Y., 4,373,837, Cl. 405-218.000.
Christ, John H., to General Motors Corporation. Compact power steering pump. 4,373,871, Cl. 417-310.000.
Christe, Karl O.; and Wilson, William W., to United States of America, Army. Stable NF_4^+ salt of high fluorine content. 4,374,112, Cl. 423-351.000.
Christensen, Inc.: *See*—
Phaal, Cornelius; and Jurgens, Rainer, 4,373,593, Cl. 175-329.000.
Christian, Robert: *See*—
Schapira, Joseph; Ruel, Jacques; Cheminaud, Jean C.; Sadlo, Robert; and Christian, Robert, 4,374,039, Cl. 252-384.000.
Christov, George. Device for indicating specimen stage positions in an electron microscope. 4,374,327, Cl. 250-442.100.
Chromalloy American Corporation: *See*—
Schaaf, Wayne J.; and Boswell, Bennie J., 4,373,591, Cl. 172-328.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Group IB metal modified zeolite catalysts. 4,374,045, Cl. 252-455.00Z.
Chu, Chin-Chiun, to Mobil Oil Corporation. Zeolite catalysts modified with group IIIA metal. 4,374,294, Cl. 585-466.000.
Chuang, Karl T.; and Roett, Maurice F., to Canada, Atomic Energy of, Limited. Method of combining gaseous hydrogen and oxygen and apparatus therefor. 4,374,116, Cl. 423-580.000.
Chun-Jung, Sun. Plural acrobatic figures on a string. 4,373,291, Cl. 46-133.000.
Church, Robert, to Gloucester Engineering Co., Inc. Air ring having a circular array of a large multiplicity of substantially parallel cell-like passages in the air flow path leading to the outlet. 4,373,273, Cl. 34-104.000.
Churchill, Richard W.; Hartman, Don W.; Howard, Richard A.; and Markowicz, Victor, to Datatrol Inc. Automatic gaming system. 4,373,726, Cl. 273-138.00A.
Cia Penha de Maquinas Agricolas-Copemag: *See*—
da Silva, Jose T., 4,373,536, Cl. 130-9.00R.
Ciba-Geigy Corporation: *See*—
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,374,134, Cl. 424-246.000.
Spivack, John D.; Dexter, Martin; and Pastor, Stephen D., 4,374,219, Cl. 524-91.000.
Traxler, Peter, 4,374,129, Cl. 424-180.000.
Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, 4,374,145, Cl. 424-278.000.
Cincinnati Milacron Inc.: *See*—
Piotrowski, Tadeusz W., 4,373,406, Cl. 74-613.000.
Cioca, Gheorghe, to Seton Company. Macromolecular biologically active collagen articles. 4,374,121, Cl. 424-19.000.
Citta, Richard W.; and Falater, Scott L., to Zenith Radio Corporation. Variable ramp speed TV tuning system for rapid channel tuning. 4,374,437, Cl. 455-164.000.
Cla-Val Co.: *See*—
Yelich, William, 4,373,550, Cl. 137-516.290.
Clarion Co., Ltd.: *See*—
Takai, Kazuki, 4,374,401, Cl. 360-96.500.
Clark Equipment Company: *See*—
Malott, Theodore A.; and Frost, Barry L., 4,373,403, Cl. 74-337.500.
Clarke, Raymond, to Raychem Corporation. Thermostatic fiber optic waveguides. 4,373,768, Cl. 350-96.340.
Clements, Philip R.; and Smith, Donald R. Loudspeaker enclosure and process for generating sound radiation. 4,373,606, Cl. 181-151.000.
Cloran, Thomas S.: *See*—
Yolton, Charles F.; Cloran, Thomas S.; and Sloan, Thomas W., 4,374,075, Cl. 264-8.000.
CNG Research Company: *See*—
Massey, Lester G.; Brabets, Robert I.; Abel, William A.; Anderson, James K.; Labus, Thomas J.; and George, Davis A., 4,373,864, Cl. 417-46.000.
Coal Industry (Patents) Limited: *See*—
West, Cecil W., 4,373,613, Cl. 188-43.000.
Wykes, John S.; and Adsley, Ian, 4,374,326, Cl. 250-255.000.
Coates, Vincent J., to Nanometrics Incorporated. Computerized micromeasuring system and method therefor. 4,373,817, Cl. 356-384.000.
Coburn Optical Industries, Inc.: *See*—
Tusinski, Joseph; and Hill, Phillip D., 4,373,298, Cl. 51-105.0LG.
Cocovich, Joseph A.: *See*—
Kite, Kenneth M.; Eberts, Allen F.; and Cocovich, Joseph A., 4,373,722, Cl. 273-85.00G.
Cohen, Saul M.; and LeBlanc, John R., to Monsanto Company. Polymer compositions comprising hemiacetals of adducts of acrolein and isocyanuric acid. 4,374,240, Cl. 528-230.000.
Colbert, Earl J. Orthodontic device. 4,373,914, Cl. 433-18.000.
Colby, Dwight D.: *See*—
van Dyke, Martin J.; Colby, Dwight D.; and Dougherty, William R., 4,373,390, Cl. 73-304.00C.
Cole, Bruce A.; Levine, Harold I.; McGuire, Michael T.; Nelson, Kathleen J.; and Slade, Louise, to General Foods Corporation. Soft, frozen dessert formulation. 4,374,154, Cl. 426-565.000.
Coleman, John R., to General Motors Corporation. Quick take-up master cylinder with check valve assembly. 4,373,333, Cl. 60-578.000.
Coleman, Lester E., to Lubrizol Corporation, The. Polymeric compositions, method for their preparation, and lubricants containing them. 4,374,034, Cl. 252-51.50A.
Colevris, Nick: *See*—
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,373,211, Cl. 2-2.000.
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, to GTE Automatic Electric Labs Inc. Arbitration controller providing for access of a common resource by a plurality of central processing units. 4,374,413, Cl. 364-200.000.
Comfort, Joseph A.; Ferry, Thomas J.; and Loos, Michel, to GTE Automatic Electric Labs Inc. Arbitration controller providing for access of a common resource by a duplex plurality of central processing units. 4,374,414, Cl. 364-200.000.
Commissariat a l'Energie Atomique: *See*—
Polge, Jacques, 4,373,680, Cl. 242-7.020.

Compagnie Francaise de Produits Industriels: *See*—
Schapira, Joseph; Ruel, Jacques; Cheminaud, Jean C.; Sadlo, Robert; and Christian, Robert, 4,374,039, Cl. 252-384.000.

Compagnie Honeywell Bull: *See*—
Bienvenu, Jacques; Carre, Claude; Tuong, Duc L.; and Verdier, Henri, 4,374,409, Cl. 364-200.000.

Comstock, Herold E. Iatrogenic shield. 4,373,915, Cl. 433-136.000.

Comte, Rheal: *See*—
Mattuck, Morris; and Comte, Rheal, 4,373,555, Cl. 138-140.000.

Conard, Robert G.: *See*—
Peli, Kynric M.; and Conard, Robert G., 4,373,808, Cl. 356-152.000.

Conaway, John R.: *See*—
Kenser, Bernard A.; and Conaway, John R., 4,374,432, Cl. 365-209.000.

Conciatori, Anthony B.: *See*—
McGinnis, James L.; and Conciatori, Anthony B., 4,374,26?, Cl. 560-56.000.

Cone, Carroll: *See*—
Jayaraman, Viswanath; and Cone, Carroll, 4,373,702, Cl. 266-111.000.

Cone, Clendon W., to Web Graphics, Inc. Gluing machine. 4,373,986, Cl. 156-552.000.

Confoey, Richard J. Bulldozer and backhoe lock device. 4,373,851, Cl. 414-722.000.

Connector Technology Corporation: *See*—
Johnston, James J., 4,373,766, Cl. 339-91.00R.

Connelly, Lawrence J.; Kane, James; and Shields, R. James, to Nalco Chemical Company. Polymers for controlling soda ash crystal formation. 4,374,102, Cl. 423-206.00T.

Connor, Ralph F., to Whirlpool Corporation. Lubrication system for rotary compressor. 4,373,356, Cl. 62-468.000.

Conover, Louis S., Jr.: *See*—
Hansen, Kenneth H.; and Conover, Louis S., Jr., 4,373,710, Cl. 270-55.000.

Conroy, John A. Semiautomatic machine for assembling paper dust jackets on new hard cover books. 4,373,844, Cl. 412-24.000.

Consolazio, George A.; and Pano, Gury, to General Foods Corporation. Process for the preparation and purification of gelatin and pyrogen-free gelatin so prepared. 4,374,063, Cl. 260-118.000.

Consolidated Packaging Corporation: *See*—
Shippell, Joseph C., 4,373,637, Cl. 206-600.000.

Container Corporation of America: *See*—
Zicko, James A., 4,373,687, Cl. 242-163.000.

Continental Group, Inc., The: *See*—
Banich, John N., Sr.; and Zipper, Donald H., 4,373,641, Cl. 215-331.000.
Walter, John, 4,373,983, Cl. 156-423.000.

Contraves AG: *See*—
Arndt, Klaus, 4,373,827, Cl. 403-24.000.

Cook, Paul M., to Raychem Corporation. Self-sealing article and process. 4,373,554, Cl. 138-137.000.

Coors Porcelain Company: *See*—
Stephan, James E.; Boduch, Paul A.; and Elverum, John A., 4,374,076, Cl. 264-19.000.

Cope, Geoffrey W., to Dresser Industries, Inc. Bearing adapter for railroad trucks having steering arms. 4,373,446, Cl. 105-224.100.

Corbett, David F., to Beecham Group Limited. β-Lactam compounds, their preparation and use. 4,374,144, Cl. 424-274.000.

Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; and Wansor, David H., to International Business Machines Corp. Host control of suspension and resumption of channel program execution. 4,374,415, Cl. 364-200.000.

Cornell, William F.; Vear, John P.; and Pascuzzi, E. Anthony, to Champion International Corporation. Stackable carton with lid. 4,373,659, Cl. 229-32.000.

Corning Glass Works: *See*—
Van Dewoestine, Robert V., 4,373,452, Cl. 110-203.000.

Corrales, Patrick G.: *See*—
Borsuk, Leslie M.; and Corrales, Patrick G., 4,373,777, Cl. 350-96.200.

Cory, Lyman R.: *See*—
Cory, Thomas R.; Cory, Lyman R.; and Maloney, Edward P., 4,373,737, Cl. 280-30.000.

Cory, Thomas R.; Cory, Lyman R.; and Maloney, Edward P. Game carrier. 4,373,737, Cl. 280-30.000.

Cosden Technology, Inc.: *See*—
Abernathy, Marshall W.; and Bailey, Darrell E., 4,374,000, Cl. 203-9.000.

Costa, Jorge, to Hermes Precisa International S.A. Thrust absorption mechanism. 4,373,708, Cl. 267-136.000.

Costruzioni Meccaniche Lonati S.p.A.: *See*—
Lonati, Francesco, 4,373,360, Cl. 66-131.000.

Coughlin, Thomas G.: *See*—
Stillman, Lee E.; and Coughlin, Thomas G., 4,373,690, Cl. 244-173.000.

Coulbourn, John N. Monitoring liquid consumption of a laboratory animal. 4,373,471, Cl. 119-72.000.

Coustre, Andre; Elitzsch, Robert; and Caullier, Jean-Claude, to Delsi. Apparatus and method for plotting a chromatogram. 4,374,424, Cl. 364-497.000.

Cox, Gordon F. N.; and Hsu, Feng H., to Standard Oil Company (Indiana). Ice island construction. 4,373,836, Cl. 405-217.000.

Coyte, Raymond G.: *See*—
Molina, Desmond W.; Hinchcliffe, Dennis; Heybourn, Frank; and Coyte, Raymond G., 4,373,624, Cl. 198-347.000.

CPG Products Corp.: *See*—
Kite, Kenneth M.; Eberts, Allen F.; and Cocovich, Joseph A., 4,373,722, Cl. 273-85.00G.

Cragg, Eric E.: *See*—
Campbell, Stephen W.; Cragg, Eric E.; Elwell, Michael J.; and Johnson, Raymond A., 4,374,188, Cl. 429-187.000.

Crane, Donald L. Illuminated house number sign. 4,373,284, Cl. 40-576.000.

Crane, Hewitt D.; and Steele, Carroll M. Accurate three dimensional eye tracker. 4,373,787, Cl. 351-210.000.

Crawford, John P., to Grogg, Thomas A.; and Turner, Clarence C., part interest to each. Key device for locking an element to a shaft. 4,373,831, Cl. 403-318.000.

Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. 3,4-Disubstituted-1,2,5-thiadiazole-1-oxide compounds. 4,374,248, Cl. 548-135.000.

Crews, Edgar W.; and Sprain, Charles E., to Western Electric Company, Inc. Method and apparatus for controlling a strand takeup reel shroud. 4,373,681, Cl. 242-25.00A.

Criscuolo, James M., to Spath, Thomas E. Orthopedic arm and shoulder brace. 4,373,517, Cl. 128-75.000.

Crivello, James V.; and Lee, Julia L., to General Electric Company. Method for making triarylsulfonium salts. 4,374,066, Cl. 260-440.000.

Crosby, Alan C.: *See*—
Tipton, Ann B.; and Crosby, Alan C., 4,374,106, Cl. 423-231.000.

Cross, William E.; and Plyler, Robert G., to General Motors Corporation. Lamp socket. 4,373,771, Cl. 339-125.00L.

Crossley Machine Company, Inc.: *See*—
Brown, Leonard, 4,373,889, Cl. 425-150.000.

Crowley, Albert T., to RCA Corporation. Digital frequency and phase lock loop. 4,374,438, Cl. 455-265.000.

Crucible Inc.: *See*—
Yolton, Charles F.; Cloran, Thomas S.; and Sloan, Thomas W., 4,374,075, Cl. 264-8.000.

Cucheran, Edward. Cutter extension cone. 4,373,277, Cl. 37-67.000.

Culbertson, Billy M.; Post, Larry K.; and Aulabaugh, Ann E., to Ashland Oil, Inc. Anhydride containing polymers derived from alkenyl succinic anhydride. 4,374,235, Cl. 526-262.000.

Cunningham, Joseph E., Jr.; and Gianos, Philip T., to International Business Machines Corporation. Automatic temperature controller for an electrophotographic apparatus fuser and method therefor. 4,374,321, Cl. 219-497.000.

Cunnington, Harry, to Norcros Investments Limited. Label web overprinter. 4,373,444, Cl. 101-228.000.

Czupryna, Gary: *See*—
Natansohn, Samuel; and Czupryna, Gary, 4,374,008, Cl. 204-109.000.

Dahlgren, Harold P.; Sullivan, William A.; Gardiner, John W.; and Taylor, James E. Portable ink fountain. 4,373,442, Cl. 101-207.000.

Daimler-Benz Aktiengesellschaft: *See*—
Schober, Karl; and Groll, Fritz, 4,373,751, Cl. 285-137.00R.
Widmann, Wolfgang, 4,373,337, Cl. 60-611.000.

Dakin, Wayne R.: *See*—
Winslow, John S.; and Dakin, Wayne R., 4,374,323, Cl. 250-201.000.

Dammann, Laurence G., to Celanese Corporation. Stable high solids water-in-oil slurry dispersion composition. 4,374,216, Cl. 524-35.000.

Damron, John W. Panel type heating apparatus. 4,374,312, Cl. 219-345.000.

Dana Corporation: *See*—
Pearch, Dean A.; and Pung, Thomas F., Sr., 4,373,358, Cl. 464-48.000.
Zlotek, T. F., 4,373,620, Cl. 192-41.00A.

Daniel, Chelliah; and Brusky, Phyllis L., to Ashland Oil, Inc. Catalytic oxydehydrogenation process. 4,374,268, Cl. 562-599.000.

Dantes, Christopher. Woodworking plane holder. 4,373,628, Cl. 206-349.000.

Danzin, Charles: *See*—
Bey, Philippe; Jung, Michel; Kolb, Michael; and Danzin, Charles, 4,374,128, Cl. 424-180.000.

Darby, Emory C. Sharpening apparatus for circular blades. 4,373,302, Cl. 51-131.100.

Darnell, Robert D.; and Ingle, William M., to Motorola, Inc. Purification of silicon source materials. 4,374,110, Cl. 423-342.000.

da Silva, Jose T., to Cia Penha de Maquinas Agricolas-Copemag. Mobile corn harvester. 4,373,536, Cl. 130-9.00R.

Datatrol Inc.: *See*—
Churchill, Richard W.; Hartman, Don W.; Howard, Richard A.; and Markowicz, Victor, 4,373,726, Cl. 273-138.00A.

Date, Takaaburo; Maki, Toshimichi; Iguchi, Mitsuya; Iwamaru, Sumifusa; and Watanabe, Hisashi, to Nippon Kokan Kabushiki Kaisha; and Toshin Seiko Kabushiki Kaisha. Apparatus for preheating a steel scrap. 4,373,911, Cl. 432-152.000.

Daubert Industries, Inc.: *See*—
Stricklin, Hazel R.; and Morrow, George W., Jr., 4,374,174, Cl. 428-341.000.

David Brown Tractors Ltd.: *See*—
Bury, Cecil T., 4,373,483, Cl. 123-198.00C.

Davis, Bruce W., to Chevron Research Company. Process for recovering hydrocarbons from a diatomite-type ore. 4,374,023, Cl. 208-11.0LE.

Davis, C. Paul, to Innovative Computer Products Corp. Non-abrasive magnetic head cleaning system. 4,374,404, Cl. 360-128.000.

Davis, Kenneth. Method and apparatus for fabricating diamond stud assemblies. 4,373,410, Cl. 76-108.00A.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 8-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-1-phenyl-1,3,8-triazaspiro[4.5]decan-4-one. 4,374,245, Cl. 546-20.000.

Davis, Larry: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,374,137, Cl. 424-258.000.

Davis, William J., to Gelman Sciences Inc. Graft copolymer membrane and processes of manufacturing and using the same. 4,374,232, Cl. 525-243.000.

Dawson, Kenneth H., to Spiral Binding Company, Inc. Bookbinding wire stock production method and apparatus. 4,373,558, Cl. 140-71.00R.

Day, William J., to Raytheon Company. Gas burner convection oven. 4,373,504, Cl. 126-21.00A.

de la Guardia, Mario J., to Carson Products Company. Hair straightening process and hair curling process and compositions therefor. 4,373,540, Cl. 424-89.000.

Deacutis, James J., to Analog Devices, Inc. Laser template trimming of circuit elements. 4,374,314, Cl. 219-121.0LJ.

Deadmore, Daniel L.; and Young, Stanley G., to United States of America, Administrator, National Aeronautics and Space Administration. Silicon-slurry/aluminide coating. 4,374,183, Cl. 428-641.000.

Dean, Robert. Staircase handrail construction. 4,373,310, Cl. 52-182.000.

Debeneix, Pierre: *See*—
Camboulives, Andre A. M. L.; Debeneix, Pierre; Gendronneau, Claude V. L.; and Hugnet, Roger P., 4,373,421, Cl. 184-6.400.

Decker, Rainer, to Precitronic Gesellschaft fur Feinmechanik und Electronic m.b.H. Device for capacitive level measurement. 4,373,389, Cl. 73-304.00C.

Declercq, Pierre J. R., to Goodyear Tire & Rubber Company, The. Tire rim and adapter. 4,373,567, Cl. 152-405.000.

Deco Coatings Corporation: *See*—
Rodenbaugh, Ralph L.; and Zwigert, John M., 4,373,437, Cl. 101-35.000.

De Donato, Victor. Stairway stringers constructed of cast, readily-assembled units. 4,373,609, Cl. 182-178.000.

Deere & Company: *See*—
Benedek, Vasile; and Huckler, Volker D., 4,373,409, Cl. 74-745.000.
Michael, Richard A., 4,373,622, Cl. 192-85.0AA.
Schuhmacher, Ernst, 4,373,924, Cl. 464-38.000.
Shindelar, Aloysius C., 4,373,551, Cl. 137-614.060.

Degussa Aktiengesellschaft: *See*—
Bitzer, Eberhard; Aichinger, Wilhelm; and Steinhilber, Gerhard, 4,374,006, Cl. 204-43.00G.
Bozon, Alfred; Lakatos, Eduard; Koberstein, Edgar; Pletka, Hans-Dieter; and Volker, Herbert, 4,374,047, Cl. 252-472.000.
Kleemann, Axel; Martens, Jurgen; and Samson, Marc, 4,374,062, Cl. 260-112.50R.

Deinet, Adolph J.; and Woods, William B., to Tenneco Chemicals, Inc. Surface-coating compositions containing polyvalent metal salts of hydroxybenzoic acid esters. 4,373,953, Cl. 106-16.000.

Deinlein, Hans; and Kummer, Gottfried, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor having a liquid coolant. 4,374,083, Cl. 376-306.000.

Dellinger, Thomas B.; and Kelly, John, Jr., to Mobil Oil Corporation. Rotary drilling drill string stabilizer-cuttings grinder. 4,373,592, Cl. 175-61.000.

Delorean Research Limited Partnership: *See*—
Smyth, Brice W., 4,373,885, Cl. 425-129.00R.

Delsi: *See*—
Coustre, Andre; Elitzsch, Robert; and Caullier, Jean-Claude, 4,374,424, Cl. 364-497.000.

Demasters, James J.: *See*—
Brainerd, Robert A., Jr.; and Demasters, James J., 4,373,595, Cl. 177-147.000.

Dembinski, Joan R., to Sterling Drug Inc. Plasma uric acid lowering method. 4,374,132, Cl. 424-241.000.

DeMoss, Dean: *See*—
Blessom, Norman S.; Ragle, Herbert U.; and DeMoss, Dean, 4,374,402, Cl. 360-104.000.

Dennison, Everett G., Jr. Moisture sensing device for pipes and the like. 4,374,379, Cl. 340-604.000.

Desai, Jaydev D., to United States of America, Navy. Gold based material for electrical contact materials. 4,374,086, Cl. 420-507.000.

DeStefano, Joseph: *See*—
Shekel, Joseph; and DeStefano, Joseph, 4,373,762, Cl. 339-31.00B.
Shekel, Joseph; and DeStefano, Joseph, 4,373,763, Cl. 339-31.00B.

Dexter, Martin: *See*—
Spivack, John D.; Dexter, Martin; and Pastor, Stephen D., 4,374,219, Cl. 524-91.000.

Diamond, Arthur S.: *See*—
Mayer, Edward F.; Diamond, Arthur S.; and Chang, Paul, 4,374,192, Cl. 430-108.000.

Dickie, Ray A.; Holubka, Joseph W.; and Qaderi, S. Burhan A., to Ford Motor Company. Alkaline resistant organic coatings for corrosion susceptible substrates III. 4,374,213, Cl. 523-416.000.

Dickinson, Warren A., Jr.: *See*—
Andonian, Harry A.; and Dickinson, Warren A., Jr., 4,374,153, Cl. 426-321.000.

Dickson, Robert A. Holder for toilet paper roll. 4,373,682, Cl. 242-55.200.

Didier Engineering GmbH: *See*—
Flockenhaus, Claus; Galow, Manfred; Meckel, Joachim F.; and Joseph, Horst G., 4,373,997, Cl. 202-230.000.

Dietz, Peter W.: *See*—
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., 4,373,272, Cl. 34-57.00A.

Dietzsch, Kurt, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Deformable light-weight housing structure. 4,373,665, Cl. 237-12.30A.

Diffracto Ltd.: *See*—
Pryor, Timothy R.; Hockley, Bernard; Liptay-Wagner, Nick; Hageniers, Omer L.; and Pastorius, W. J., 4,373,804, Cl. 356-1.000.

DiGiacomo, Peter M.: *See*—
Dines, Martin B.; and DiGiacomo, Peter M., 4,374,242, Cl. 528-395.000.

Dines, Martin B.; and DiGiacomo, Peter M., to Occidental Research Corporation. Layered organoarsenous inorganic polymers. 4,374,242, Cl. 528-395.000.

Discovision Associates: *See*—
Winslow, John S.; and Dakin, Wayne R., 4,374,323, Cl. 250-201.000.

Displaymor Manufacturing Company, Inc.: *See*—
Monroe, John E., 4,373,355, Cl. 62-256.000.

Dixon, Katharine N.: *See*—
Wolfe, Richard M.; and Dixon, Katharine N., 4,373,222, Cl. 5-431.000.

Dochterman, Richard W., to General Electric Company. Motor mounting arrangement, device for mounting a motor, and methods. 4,373,696, Cl. 248-604.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Mertens, Walter; Thubeauville, Heinz; and Glittenberg, Wilhelm, 4,373,244, Cl. 29-402.080.

Dr. Carl Hahn G.m.b.H.: *See*—
Friese, Axel; and Simunek, Frantisek, 4,373,631, Cl. 206-438.000.

Doliber, Darrel L.; and Keil, O'Dell M., to Litton Systems Inc. Adjustment mechanism. 4,373,269, Cl. 33-246.000.

Dolman, Hendrik; and Kuipers, Johannes, to Duphar International Research B.V. 2-Arylimino-imidazolidines, compositions containing same, and method of use thereof. 4,374,143, Cl. 424-273.00R.

Domazer, Hans-Gunter: *See*—
Buttner, Gunter; Domazer, Hans-Gunter; and Eggert, Horst, 4,373,947, Cl. 75-0.5BB.

Donze, Michel, to Etablissements Somalor-Ferrari "Somafer". Method of removing cracks, and multiple-shape torch for carrying out the method. 4,373,969, Cl. 148-9.500.

Dorosz, Adolph S.; Kirwan, Patrick N.; and Szydlek, Nicholas P., to USM Corporation. Method and machine for versatile stitching. 4,373,458, Cl. 112-121.120.

Dorsey, Glenn F., to Litton Systems, Inc. Single channel optical slip ring. 4,373,779, Cl. 350-96.210.

Dotz, Karl H., to Hoffmann-La Roche Inc. Process for preparing vitamin K. 4,374,290, Cl. 585-16.000.

Doucet, Jos, to Raychem Corporation. Adhesive composition. 4,374,231, Cl. 525-179.000.

Dougherty, Philip H.: *See*—
Gallagher, John P.; and Dougherty, Philip H., 4,374,211, Cl. 523-156.000.

Dougherty, William R.: *See*—
van Dyke, Martin J.; Colby, Dwight D.; and Dougherty, William R., 4,373,390, Cl. 73-304.00C.

Douglas, Raymond J.; May, Herbert; Poznick, Jeffrey B.; and Sweet, Roger H., to Mattel, Inc. Toy trap door mechanism. 4,373,289, Cl. 46-1.00R.

Dow Chemical Company, The: *See*—
Meyer, Louis W., 4,374,222, Cl. 524-241.000.
Socha, Gregory E., 4,373,959, Cl. 106-194.000.

Dow Corning Corporation: *See*—
Gaul, John H.; and Weyenberg, Donald R., 4,374,182, Cl. 428-446.000.

Draenert, Klaus, to Merck Patent Gesellschaft mit Beschrankter Haftung. Implantation materials and a process for the production thereof. 4,373,217, Cl. 3-1.900.

Dravo Corporation: *See*—
Kilian, Alois, 4,373,946, Cl. 75-5.000.

Dresser Industries, Inc.: *See*—
Cope, Geoffrey W., 4,373,446, Cl. 105-224.100.

Drost, Jim L.; and Gordin, Myron K., to Muscatine Lighting Mfg. Co., Inc. Ballast mounting means. 4,374,407, Cl. 362-432.000.

Drzewiecki, Tadeusz M., to United States of America, Army. Broad band fluoric amplifier. 4,373,553, Cl. 137-840.000.

DSH: *See*—
Pallotta, Frank, 4,373,448, Cl. 108-29.000.

DuBois, Chester G.: *See*—
Billingsley, Henry C.; and DuBois, Chester G., 4,373,479, Cl. 123-187.50R.

Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, to Thomson-CSF. Illuminator for supplying a divergent illuminating beam from a predetermined area of a plane. 4,373,774, Cl. 350-6.600.

Duchemin, Michel, to Ressorts Industrie. Devices for elastically fastening rail-way rails by locking. 4,373,667, Cl. 238-349.000.

Dugan, Robert J.: *See*—
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; and Wansor, David H., 4,374,415, Cl. 364-200.000.

Dugan, William P., to General Dynamics, Pomona Division. Fine line circuitry probes and method of manufacture. 4,374,003, Cl. 204-11.000.

Dukhovskoi, Evgeny A.: *See*—
Goretik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.

Dunlop Limited: *See*—
Fallows, John C. J.; and Harvey, Richard G., 4,374,208, Cl. 521-109.000.

Dunn, William H.; Garron, Stephen A.; Horey, Leonard I.; and Wurst, John W., to Singer Company, The. Electronically controlled sewing machine arranged to sew a sequence of stitch patterns. 4,373,459, Cl. 112-158.00E.

Dunnavant, William R.; Field, Richard E.; and Borgnaes, Dan, to Ashland Oil, Inc. Thermosetting resinous molding compositions. 4,374,229, Cl. 525-28.000.

Duphar International Research B.V.: *See*—
Dolman, Hendrik; and Kuipers, Johannes, 4,374,143, Cl. 424-273.00R.

Du Pont de Nemours, E. I., and Company: *See*—
Beasley, John K.; and Urban, Edward J., 4,374,224, Cl. 524-298.000.
Heinsohn, George E., 4,374,273, Cl. 564-479.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Imidazoline containing imidazoles. 4,374,251, Cl. 548-309.000.

Durham, M. E. Automatic fuel control system. 4,373,850, Cl. 414-699.000.

Durham, Roger O. Drawbolt bearing support for bicycle pedals. 4,373,760, Cl. 308-179.500.

Duriron Company, Inc., The: *See*—
Brown, Robert J.; and Shepherd, Kenneth D., 4,373,543, Cl. 137-74.000.

Duskinfranchise Kabushiki Kaisha: *See*—
Bandai, Shinji; Kajimaki, Masao; Nakajima, Yoshihiro; Yagi, Akira; and Nishimura, Haruo, 4,373,224, Cl. 15-1.50A.

Dyson, James. Vacuum cleaning appliances. 4,373,228, Cl. 15-350.000.

E. R. Squibb & Sons, Inc.: *See*—
Petrillo, Edward W., Jr., 4,374,131, Cl. 424-200.000.

Earthquake Preparedness Co., Inc.: *See*—
Evans, George Q., 4,373,307, Cl. 52-167.000.

Eastman, James M., to Bendix Corporation, The. Flow regulating shaft seal for an air motor. 4,373,858, Cl. 415-112.000.

Eastman Kodak Company: *See*—
Herz, Arthur H., 4,374,196, Cl. 430-505.000.
Hutchinson, William J., 4,374,195, Cl. 430-499.000.
Kim, Chang-Kyu; and Maggiulli, Cataldo A., 4,374,253, Cl. 548-360.000.
Larkins, Thomas H.; Polichnowski, Stanley W.; Tustin, Gerald C.; and Young, David A., 4,374,070, Cl. 260-549.000.
Larkins, Thomas H., Jr., 4,374,265, Cl. 560-263.000.
McGuckin, Hugh G.; Hartman, Susan E.; and Specht, Donald P., 4,374,194, Cl. 430-199.000.
Mir, Jose M., 4,374,397, Cl. 358-75.000.

Eaton Corporation: *See*—
Bradshaw, Cyril E., 4,373,495, Cl. 123-568.000.
Buente, Stephen M.; and Hillebrand, George A., 4,373,477, Cl. 123-90.550.
Goscenski, Edward J., Jr., 4,373,482, Cl. 123-198.00R.

Eberts, Allen F.: *See*—
Kite, Kenneth M.; Eberts, Allen F.; and Cocovich, Joseph A., 4,373,722, Cl. 273-85.00G.

Eckelmann, Gunther, to Pillard, Inc. Burner for a kiln. 4,373,900, Cl. 431-182.000.

Economou, Peter: *See*—
Thompson, Thomas D.; Gergel, John F.; and Economou, Peter, 4,374,203, Cl. 501-148.000.

Edwards, Bryant, to Illinois Tool Works Inc. Resilient nestable cup. 4,373,634, Cl. 206-520.000.

Edwards, Robert E.; McKee, Donald H.; and Brown, Claude D., to Roy M. Moffitt Company, The. Skin washer. 4,373,363, Cl. 69-28.000.

Edwin Cooper, Inc.: *See*—
Malec, Robert E., 4,374,033, Cl. 252-49.600.

Effland, Richard C.; Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. Spiro[benzofuranisoquinoline]s and their use as pharmaceuticals. 4,374,137, Cl. 424-258.000.

Eggert, Horst: *See*—
Buttner, Gunter; Domazer, Hans-Gunter; and Eggert, Horst, 4,373,947, Cl. 75-0.5BB.

Egli, Alwin, to Platmanufaktur AB. Container with lid. 4,373,317, Cl. 53-412.000.

Ehrlinger, Friedrich; and Meyerle, Michael, to Zahnradfabrik Friedrichshafen A.G. Hydrostatic-mechanical gear unit. 4,373,359, Cl. 74-687.000.

Eicken, Karl; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal agents based on acetanilides. 4,373,945, Cl. 71-92.000.

Eida, Tsuyoshi; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Ohta, Tokuya, to Canon Kabushiki Kaisha. Recording liquid and method for producing the same. 4,373,954, Cl. 106-20.000.

El Paso Polyolefins Company: *See*—
Allan, John L. H.; Finestone, Arnold B.; and Roderick, John J., 4,374,230, Cl. 525-134.000.

El-Bourini, Refki M.: *See*—
Saperstein, Zalman P.; El-Bourini, Refki M.; and Munch, John E., Jr., 4,373,578, Cl. 165-141.000.

Electronic Memories and Magnetics Corporation: *See*—
Kenner, Bernard A.; and Conaway, John R., 4,374,432, Cl. 365-209.000.

Electrostatic Equipment Company: *See*—
McMahon, Roy C., 4,373,494, Cl. 123-538.000.

Elf France: *See*—
Maldonado, Paul; Nouguier, Robert; Fayard, Jean-Claude; and Leger, Robert, 4,374,282, Cl. 568-672.000.

Elhaus, Friedrich W.; and Hilge, Bernhard, to Elhaus, Friedrich Wilhelm; and Prolizenz A.G. Apparatus for heat treatment of material to be worked on, especially of aluminum or magnesium alloys. 4,373,706, Cl. 266-252.000.

Elhaus, Friedrich Wilhelm: *See*—
Elhaus, Friedrich W.; and Hilge, Bernhard, 4,373,706, Cl. 266-252.000.

Eli Lilly and Company: *See*—
Ayers, Grover W., 4,373,263, Cl. 30-294.000.

Elitzsch, Robert: *See*—
Coustre, Andre; Elitzsch, Robert; and Caullier, Jean-Claude, 4,374,424, Cl. 364-497.000.

Ellis, David G.: *See*—
Boners, Joseph J. P.; Ellis, David G.; Jansen, Johann J.; and Bijen, Jan M. J. M., 4,373,981, Cl. 156-164.000.

Ellis, Howard F.; and Fishman, Herbert, to General Electric Company. Zinc oxide varistor composition not containing silica. 4,374,049, Cl. 252-519.000.

Eher, Dieter, to Zahnradfabrik Friedrichshafen, AG. Auxiliary steering for motor vehicles. 4,373,598, Cl. 180-143.000.

Elsworth, Robert M., to Elsworth, Robert M. Apparatus for filling caulking tubes. 4,373,560, Cl. 141-129.000.

Elverum, John A.: *See*—
Stephan, James E.; Boduch, Paul A.; and Elverum, John A., 4,374,076, Cl. 264-19.000.

Elwell, Michael J.: *See*—
Campbell, Stephen W.; Cragg, Eric E.; Elwell, Michael J.; and Johnson, Raymond A., 4,374,188, Cl. 429-187.000.

Embosograph Display Mfg. Co.: *See*—
Swartz, William M., 4,373,283, Cl. 40-564.000.

Emerson Electric Co.: *See*—
Krause, James A.; and Kitsch, Edward A., 4,373,937, Cl. 55-118.000.

EMI Limited: *See*—
Pullen, Geoffrey J.; Pemberton, John A.; and Brown, Colin J., 4,373,319, Cl. 53-573.000.

Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,374,251, Cl. 548-309.000.

Endo, Akinori; and Kato, Hirokazu, to Nippon Gakki Seizo Kabushiki Kaisha. Wave generator for electronic musical instrument. 4,373,416, Cl. 84-1.010.

Enfors, Sven-Olof. Oxygen stabilized enzyme electrode. 4,374,013, Cl. 204-195.00B.

Engeler, William E., to General Electric Company. Signal comparator apparatus. 4,374,334, Cl. 307-355.000.

Engelhard Minerals & Chemicals Corporation: *See*—
Bartholic, David B., 4,374,021, Cl. 208-251.00R.

English Electric Valve Company Limited: *See*—
Howorth, Jonathan R., 4,374,325, Cl. 250-213.0VT.

Enhancement Systems, Inc.: *See*—
Wolfe, Richard M.; and Dixon, Katharine N., 4,373,222, Cl. 5-431.000.

Enoki, Shigenaga: *See*—
Tomita, Takao; Yamamoto, Hitoshi; Enoki, Shigenaga; Goto, Isamu; and Hashimoto, Takeshi, 4,373,602, Cl. 180-227.000.

Ensinger, James W., to Zenith Radio Corporation. Insertion of non-synchronous data into vertical interval. 4,374,399, Cl. 358-147.000.

Environmental Sciences Associates, Inc.: *See*—
Matson, Wayne R., 4,374,041, Cl. 436-60.000.

Erlandson, Roger S. Archery arm guard. 4,373,213, Cl. 2-16.000.

Ernst Mohrbach KG: *See*—
Mohrbach, Hans, 4,373,413, Cl. 83-123.000.

Errede, Louis A.; Stoesz, James D.; and Winter, George D., deceased (by Upton, Jenny, personal representative), to Minnesota Mining and Manufacturing Company. Composite wound dressing. 4,373,519, Cl. 128-156.000.

Escher Wyss Limited: *See*—
Guttinger, Heinz, 4,373,238, Cl. 29-116.0AD.

Essex Group, Inc.: *See*—
McGregor, Charles W.; and Summers, Stephen E., 4,374,221, Cl. 524-94.000.

Etablissements Somalor-Ferrari "Somafer": *See*—
Donze, Michel, 4,373,969, Cl. 148-9.500.

Ethyl Corporation: *See*—
Kao, James T. F.; and Jensen, Wayne D., 4,374,254, Cl. 548-527.000.
Kao, James T. F.; and Farritor, Robert E., 4,374,255, Cl. 548-531.000.
Kao, James T. F.; and Wiegand, Karl E., 4,374,256, Cl. 548-561.000.

Euteco Impianti S.p.A.: *See*—
Messina, Giuseppe; Moretti, Mario D.; and Lorenzoni, Loreno, 4,374,279, Cl. 568-558.000.
Messina, Giuseppe; Moretti, Mario D.; and Lorenzoni, Loreno, 4,374,280, Cl. 568-558.000.

Evans, George Q., to Earthquake Preparedness Co., Inc. Adjustable earthquake backstop support for mobile homes. 4,373,307, Cl. 52-167.000.

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Cardarelli, Nathan F.; and Evans, William H., 4,374,126, Cl. 424-81.000.
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Wittrock, Michael C., 4,373,590, Cl. 172-78.000.
Ewen, James H.; McClellan, Thomas R.; McMillin, Michael H.; and Murray, Pat L., to Upjohn Company, The. Polyurea-polyurethane from a mixture of a polyol, an aromatic diamine, and an isocyanate-terminated prepolymer. 4,374,210, Cl. 521-159.000.
Exxon Production Research Co.: *See—*
Bednar, John M.; Postler, Daniel P.; and Jones, Terry V., 4,373,582, Cl. 166-65.00R.
F. P. Rosback Company: *See—*
Glendening, Major D., 4,373,985, Cl. 118-103.000.
Fabris, Mario. Roller entry guides for rod mills. 4,373,367, Cl. 72-250.000.
Fairchild Camera & Instrument: *See—*
Caldwell, Robert E., 4,373,252, Cl. 29-576.00B.
Fairchild Camera & Instrument Corp.: *See—*
Vora, Madhukar B.; and Rust, Werner F., 4,374,011, Cl. 204-192.0EC.
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Citta, Richard W.; and Falater, Scott L., 4,374,437, Cl. 455-164.000.
Fallows, John C. J.; and Harvey, Richard G., to Dunlop Limited. Polyether-urethane foams. 4,374,208, Cl. 521-109.000.
Fanslow, Charles E. Method and apparatus assembling and nailing boards together. 4,373,651, Cl. 227-3.000.
Faris, Bernard L. Apparatus for suspending a planter. 4,373,695, Cl. 248-318.000.
Farnham, Robert A., to Chevron Research Company. Method and apparatus for uniform flow through radial reactor centerpipes. 4,374,094, Cl. 422-218.000.
Farooq, Saleem: *See—*
Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, 4,374,145, Cl. 424-278.000.
Farrant, Herbert H., to Burrowes, John Kenneth. Building elements and building methods. 4,373,315, Cl. 52-522.000.
Farrell, John D.: *See—*
Bouchard, James P.; and Farrell, John D., 4,373,955, Cl. 106-88.000.
Farritor, Robert E.: *See—*
Kao, James T. F.; and Farritor, Robert E., 4,374,255, Cl. 548-531.000.
Faulring, Gloria M.; Fitzgibbon, Alan; and Slish, Frank, to Union Carbide Corporation. Addition agents for iron-base alloys. 4,373,948, Cl. 75-57.000.
Faure, Jean-Louis, to ASA S.A. Drive system and drawframe system for a rove drawing process. 4,373,233, Cl. 19-236.000.
Fayard, Jean-Claude: *See—*
Maldonado, Paul; Nouguier, Robert; Fayard, Jean-Claude; and Leger, Robert, 4,374,282, Cl. 568-672.000.
Febvret, Thierry: *See—*
Boutteville, Raymond; and Febvret, Thierry, 4,373,385, Cl. 73-146.500.
Fechtig, Bruno: *See—*
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,374,134, Cl. 424-246.000.
Fedders Corporation: *See—*
Anzalone, Carmen J., 4,373,353, Cl. 62-200.000.
Feldman, Allan M.: *See—*
Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., 4,374,107, Cl. 423-265.000.
Fellowes Manufacturing: *See—*
Klaus, Gerald R.; and Williams, Thomas E., 4,373,449, Cl. 108-60.000.
Fenyes, Joseph G. E.; and Pera, John D., to Buckman Laboratories, Inc. Aminoalkylenephosphonic acids and salts thereof and their use in aqueous systems. 4,374,040, Cl. 252-389.00A.
Fera, Victor, to Sage Manufacturing Co., Inc. One-piece buckle and keeper assembly. 4,373,236, Cl. 29-3.000.
Ferris, Donald L.; and Ogle, Peter C., to United Technologies Corporation. Rotor blade shaft integrity monitoring system. 4,373,862, Cl. 416-61.000.
Fesko, Donald G., to Ford Motor Company. Room temperature cure polyester laminates. 4,374,170, Cl. 428-224.000.
Fey, Rainer. Control circuit for a part which is moved in an oscillating manner by an electric drive. 4,374,330, Cl. 307-132.00E.
Fiala, Werner: *See—*
v.Eckardstein, Karl-Ernst; Fiala, Werner; and Schwing, Friedrich, 4,373,225, Cl. 15-104.06A.
Fiber Industries, Inc.: *See—*
Langley, Jeffrey T., 4,374,228, Cl. 524-599.000.
Ficht GmbH: *See—*
Schindler, Manfred; Ficht, Reinhold; and Vogt, Hermann, 4,373,474, Cl. 123-56.00B.
Ficht, Reinhold: *See—*
Schindler, Manfred; Ficht, Reinhold; and Vogt, Hermann, 4,373,474, Cl. 123-56.00B.
Fickelscher, Kurt G. Elastic coupling. 4,373,925, Cl. 464-158.000.
Fidelity Electronics, Ltd.: *See—*
Nelson, Ronald C.; and Merrick, Richard L., Jr., 4,373,719, Cl. 273-1.00E.
Field, Richard E.: *See—*
Dunnavant, William R.; Field, Richard E.; and Borgnaes, Dan, 4,374,229, Cl. 525-28.000.
Fifolt, Michael J.; and Foster, Arthur M., to Occidental Chemical Corporation. Ammonium salts of fluorophthalamic acids and method of preparation. 4,374,266, Cl. 562-456.000.
Fifolt, Michael J.; and Foster, Arthur M., to Occidental Chemical Corporation. Fluorophthalamic acids and method of preparation. 4,374,267, Cl. 562-456.000.
Fillon, Marc. Devices and method for delivery of solder and brazing material. 4,373,657, Cl. 228-229.000.
Filterwerk Mann & Hummel GmbH: *See—*
Bendig, Lothar, 4,373,499, Cl. 123-574.000.
Finestone, Arnold B.: *See—*
Allan, John L. H.; Finestone, Arnold B.; and Roderick, John J., 4,374,230, Cl. 525-134.000.
Finn, Bernard J.: *See—*
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Firmenich SA: *See—*
Naf, Regula; Pickenhagen, Wilhelm; and Morris, Anthony F., 4,374,051, Cl. 252-522.00R.
Fischell, Robert E., to Johns Hopkins University, The. Implantable, programmable medication infusion system. 4,373,527, Cl. 128-260.000.
Fischer, Charles P.: *See—*
Piscitelli, R. Amelia; Hemmer, Valentine J.; Fischer, Charles P.; and Shepler, Eric F., 4,373,773, Cl. 339-262.00R.
Fischer, Harry C.: *See—*
Tyree, Lewis, Jr.; and Fischer, Harry C., 4,373,345, Cl. 62-79.000.
Fish, Daniel C. E., to Leigh Flexible Structures Limited. Fillable structure. 4,373,462, Cl. 114-74.00R.
Fisher, Donald L.: *See—*
Gardner, Kenneth L.; Gootzait, Edward; Maciejewski, Edward T.; and Fisher, Donald L., 4,373,451, Cl. 110-101.0CC.
Fishman, Herbert: *See—*
Ellis, Howard F.; and Fishman, Herbert, 4,374,049, Cl. 252-519.000.
Fishman, Walter; and Jenkins, Theron W., Jr., to Leeds & Northrup Company. Digital drive unit regulator. 4,374,351, Cl. 318-600.000.
Fitch, John L.; and Mullins, Lynn D., to Mobil Oil Corporation. Method of solvent flooding to recover viscous oils. 4,373,585, Cl. 166-263.000.
Fitzgibbon, Alan: *See—*
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Flanagan, James L., to Bell Telephone Laboratories, Incorporated. Spectrum division/multiplication communication arrangement for speech signals. 4,374,304, Cl. 179-15.55R.
Flanagan, Joseph E.; and Haury, Vernon E., to Rockwell International Corporation. Gun propellant containing nitroaminoguanidine. 4,373,976, Cl. 149-92.000.
Fleissner, Hans, to Vepa AG. Apparatus for the continuous washing of lengths of textile material. 4,373,362, Cl. 68-9.000.
Fleming, Joseph T.: *See—*
Smith, Harvey A.; and Fleming, Joseph T., 4,373,377, Cl. 73-23.000.
Flint & Walling, Inc.: *See—*
Robinson, Jimmie R., 4,373,849, Cl. 414-408.000.
Flockenhaus, Claus; Galow, Manfred; Meckel, Joachim F.; and Joseph, Horst G., to Didier Engineering GmbH. Apparatus for the transfer and quenching of coke. 4,373,997, Cl. 202-230.000.
FMC Corporation: *See—*
Buchta, Ervin A., 4,373,700, Cl. 251-214.000.
Foley, Ted: *See—*
Ulin, Roy A.; Foley, Ted; and Shah, Hasmukh, 4,373,629, Cl. 206-350.000.
Forbes, Brian K.: *See—*
Catiller, Robert D.; and Forbes, Brian K., 4,374,416, Cl. 364-200.000.
Catiller, Robert D.; and Forbes, Brian K., 4,374,418, Cl. 364-200.000.
Forbes, Donald R.; and Forbes, Edson A. Spreader control. 4,373,668, Cl. 239-74.000.
Forbes, Edson A.: *See—*
Forbes, Donald R.; and Forbes, Edson A., 4,373,668, Cl. 239-74.000.
Ford Motor Company: *See—*
Dickie, Ray A.; Holubka, Joseph W.; and Qaderi, S. Burhan A., 4,374,213, Cl. 523-416.000.
Fesko, Donald G., 4,374,170, Cl. 428-224.000.
Gandhi, Haren S.; and Adams, Karen M., 4,374,103, Cl. 423-213.500.
Giardini, Dante S., 4,373,671, Cl. 239-585.000.
Kaufman, Sydney M., 4,373,675, Cl. 241-23.000.
Liu, You C., 4,373,371, Cl. 72-379.000.
Rado, William G., 4,373,501, Cl. 123-589.000.
Sabel, Gustav, 4,373,618, Cl. 192-4.00B.
Vong, Sandy T. S., 4,374,156, Cl. 427-8.000.
Washburn, William J.; Thompson, Hugh B.; and La Fever, Clifford E., 4,373,422, Cl. 89-33.0CA.
Foreman, Brian E.; and Grooms, John M., to Burton Mechanical Contractors Inc. Vacuum sewage transport system. 4,373,838, Cl. 406-14.000.
Foresto, Samuel. Apparatus and method for utilizing hot waste gases. 4,373,453, Cl. 110-216.000.

Forknall, John P.: *See*—
Greener, Brian; Pedder, Simon J.; and Forknall, John P., 4,373,759, Cl. 308-187.200.

Forterre, Gerard, to Thomson-CSF. Non-reciprocal microwave-frequency device for high-level operation. 4,374,367, Cl. 333-24.100.

Foster, Arthur M.: *See*—
Fifolt, Michael J.; and Foster, Arthur M., 4,374,266, Cl. 562-456.000.
Fifolt, Michael J.; and Foster, Arthur M., 4,374,267, Cl. 562-456.000.

Foster, Dean H.; and Silverman, Harold, to Pitney Bowes Inc. Inserter feeder assemblies. 4,373,711, Cl. 271-171.000.

Foster Poultry Farms: *See*—
Harding, Robert R.; and Stuermer, Walter L., 4,373,232, Cl. 17-11.000.

Foundry & Steel, Inc.: *See*—
McKinley, John T., 4,373,927, Cl. 474-74.000.

Fouss, James L.; Rosenbaum, Larry A.; and Child, James L., Jr., to Hancor, Inc. Method and apparatus for manufacturing expanded and layered semiround plastic tubings. 4,374,079, Cl. 264-46.100.

Fox, Robert B.: *See*—
Kim, Oh-Kil; and Fox, Robert B., 4,374,048, Cl. 252-500.000.

Fram Europe Limited: *See*—
Mules, Robert S., 4,373,635, Cl. 206-525.000.

Framatome: *See*—
Lebouc, Bernard, 4,373,855, Cl. 414-744.00R.

Frame, Robert R., to UOP Inc. Method of reactivating a catalytic composite of a carrier material and a mercaptan oxidation catalyst. 4,374,042, Cl. 252-412.000.

France Bed Co., Ltd.: *See*—
Masuda, Teruo; Morita, Masayasu; Yamaguchi, Kazuyuki; and Harada, Yoshikazu, 4,373,516, Cl. 128-57.000.

Frank, Charles E. Disk throwing game. 4,373,734, Cl. 273-411.000.

Franklin, Grover C., Jr. Method for separating a dispersed phase from a continuous phase. 4,374,030, Cl. 210-758.000.

Frederick, Roderick J. Conveyor to interfit with a loaded shopping cart and to move portions of the load, on demand of a checker, to the front of the cart, for removal, price scanning, and bagging, by the checker at a checkout stand. 4,373,611, Cl. 186-64.000.

Frederick, Sherman B.: *See*—
Kimzey, Paul W.; and Frederick, Sherman B., 4,373,227, Cl. 15-347.000.

Fricke, Hans; Kiess, Jurgen; and Schulmeyer, Lutz, to International Standard Electric Corporation. Decoupling arrangement for non-insulated AC track circuits in railway systems. 4,373,691, Cl. 246-34.0CT.

Fricke, Hans J., to Robert Bosch GmbH. Glide shoe of a hydraulic piston machine. 4,373,428, Cl. 92-159.000.

Frieder, Leonard P., Jr., to Gentex Corporation. Local external communication device for enclosed helmet and mask assembly. 4,374,301, Cl. 179-1.00R.

Friedrich Wilh. Schwing GmbH: *See*—
Schwing, Friedrich, 4,373,875, Cl. 417-517.000.
v.Eckardstein, Karl-Ernst; Fiala, Werner; and Schwing, Friedrich, 4,373,225, Cl. 15-104.06A.

Friese, Axel; and Simunek, Frantisek, to Dr. Carl Hahn G.m.b.H. Tampon pack especially for a coated tampon containing medicaments. 4,373,631, Cl. 206-438.000.

Friggstad Manufacturing Ltd.: *See*—
Friggstad, Terrance, 4,373,455, Cl. 111-86.000.

Friggstad, Terrance, to Friggstad Manufacturing Ltd. Seed boot assembly. 4,373,455, Cl. 111-86.000.

Frik, Martina: *See*—
Bauser, Elisabeth; Frik, Martina; Lochner, Karl S.; and Schmidt, Laurenz, 4,373,988, Cl. 156-622.000.

Frimodig, Carl H., Jr.: *See*—
Geis, William A.; and Frimodig, Carl H., Jr., 4,373,547, Cl. 137 377.000.

Frito-Lay, Inc.: *See*—
Kreager, William D.; and Mason, Stanley I., Jr., 4,373,982, Cl. 156-359.000.

Frost, Barry L.: *See*—
Malott, Theodore A.; and Frost, Barry L., 4,373,403, Cl. 74-337.500.

Fuchs, Josef: *See*—
Grundler, Robert; Fuchs, Josef; and Jenni, Herbert, 4,373,557, Cl. 139-142.000.

Fuderer, Andrija, to Union Carbide Corporation. Constant pressure separation of normal paraffins from hydrocarbon mixtures. 4,374,022, Cl. 208-310.00Z.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Takizawa, Junichi; and Satoh, Nobuo, 4,373,747, Cl. 280-802.000.

Fuji Xerox Co., Ltd.: *See*—
Iyoda, Tetsuo; and Kikuchi, Masatsugu, 4,374,387, Cl. 346-75.000.

Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, to Kao Corporation. Perfume composition. 4,374,052, Cl. 252-522.00R.

Fujioka, Yoshiki: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,374,350, Cl. 318-590.000.

Fujishiro, Takeshi; Takeuchi, Kiyoshi; and Kita, Toru, to Nissan Motor Company, Limited. Vibration sensor for an automotive vehicle. 4,373,378, Cl. 73-35.000.

Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; and Miyashita, Hideo, 4,374,349, Cl. 318-568.000.
Kohzai, Yoshinori; Oyama, Shigeaki; and Koyama, Tatsuo, 4,374,337, Cl. 310-186.000.
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,374,350, Cl. 318-590.000.

Fujitsu Limited: *See*—
Higuchi, Mitsuo, 4,374,430, Cl. 365-104.000.
Ono, Chikai; and Toyoda, Kazuhiro, 4,374,431, Cl. 365-174.000.
Sakai, Toshihiro; and Kuhara, Tetsuji, 4,374,410, Cl. 364-200.000.

Fujiwara, Haruyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Slice lip forming a smooth continuous surface. 4,373,993, Cl. 162-347.000.

Fujiwara, Hiroshi: *See*—
Matsuura, Tsuyoshi; Fujiwara, Hiroshi; Aihara, Mamoru; Takahashi, Yutaka; and Nakajima, Yoshio, 4,373,796, Cl. 354-173.000.

Fuka, Louis R. Single actuator electronic minicomputer. 4,374,425, Cl. 364-709.000.

Fukahori, Kiyoshi; and Nishikawa, Yukio, to Precision Monolithics, Inc. Tuneable I.C. active integrator. 4,374,335, Cl. 307-521.000.

Fullerton, Robert L. Automatic transmission having a continuously variable drive ratio. 4,373,926, Cl. 474-57.000.

Furukawa Battery Co., Ltd., The: *See*—
Sano, Ichiro, 4,374,187, Cl. 429-175.000.

Furukawa, Satoru: *See*—
Okahashi, Keiji; Motoyama, Masanori; and Furukawa, Satoru, 4,374,311, Cl. 200-269.000.

Furutani, Yoshikazu: *See*—
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Fushio, Masamori: *See*—
Kamei, Shigeki; Fushio, Masamori; and Hirai, Atuo, 4,373,433, Cl. 100-37.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Takagi, Toshinori, 4,374,162, Cl. 427-248.100.

G.F.C. Foam Corporation: *See*—
Stone, Herman; Pauly, Peter D.; and Pcolinsky, Michael P., Jr., 4,374,207, Cl. 521-107.000.

GAF-Huls Chemie GmbH: *See*—
Westernacher, Helmut; and Aertken, Karl, 4,373,999, Cl. 203-6.000.

Gaiser, Robert F., to Bendix Corporation, The. Visual fluid level indicator. 4,373,465, Cl. 116-227.000.

Gallagher, John P.; and Dougherty, Philip H., to Thiokol Corporation. Aramid containing friction materials. 4,374,211, Cl. 523-156.000.

Galley, Richard A.: *See*—
Bryant, David R.; and Galley, Richard A., 4,374,278, Cl. 568-454.000.

Galow, Manfred: *See*—
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Gambro Heart-Lung Products AB: *See*—
Stenberg, Kaj O.; Traven, Lars J. C.; Losell, Ingvar F.; and Johnsson, Bo A., 4,374,088, Cl. 422-46.000.

Gandhi, Haren S.; and Adams, Karen M., to Ford Motor Company. Method of using a low cost catalyst system. 4,374,103, Cl. 423-213.500.

Gandini, Giovanni; and Talamona, Enrico. Equipment for the injection molding of spectacles bars of plastic material with metal core. 4,373,884, Cl. 425-126.00R.

Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,374,251, Cl. 548-309.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Mitzel, Wilhelm, 4,373,712, Cl. 271-272.000.

Garasi, Louis A.; and Hayes, Ronald F., to Gruber Systems, Inc. Cast toilet base structure. 4,373,219, Cl. 4-300.000.

Gardiner, John W.: *See*—
Dahlgren, Harold P.; Sullivan, William A.; Gardiner, John W.; and Taylor, James E., 4,373,442, Cl. 101-207.000.

Gardner, Kenneth L.; Gootzait, Edward; Maciejewski, Edward T.; and Fisher, Donald L., to Kennedy Van Saun Corporation. Apparatus and method for feeding pulverized solid fuel to a burner. 4,373,451, Cl. 110-101.0CC.

Garg, Desh R.: *See*—
Ausikaitis, Joseph P.; and Garg, Desh R., 4,373,935, Cl. 55-33.000.

Garlapaty, Venkat R.; Hall, Michael J.; and Branham, William C., to Tol-O-Matic, Inc. Fluid pressure cylinder. 4,373,427, Cl. 92-88.000.

Garron, Stephen A.: *See*—
Dunn, William H.; Garron, Stephen A.; Horey, Leonard I.; and Wurst, John W., 4,373,459, Cl. 112-158.00E.

Gasparian, George A., to International Telephone and Telegraph Corporation. Fiber dichroic coupler. 4,373,775, Cl. 350-96.150.

Gaston, Harold W.; and Glaser, Donald J., to Glendo Corporation. Tool finishing machine having improved support table. 4,373,299, Cl. 51-122.000.

Gaul, John H.; and Weyenberg, Donald R., to Dow Corning Corporation. Preparation of silicon metal through polymer degradation. 4,374,182, Cl. 428-446.000.

Gaule, Gerhart K.: *See*—
Yarwood, John C.; Gaule, Gerhart K.; and Ungarean, Gary L., 4,373,571, Cl. 164-467.000.

Gauthier, George A.: *See*—
Wallick, William P.; and Gauthier, George A., 4,373,431, Cl. 99-483.000.

Gavenonis, Thomas L.: *See*—
Hall, Harold H., Jr.; Bouchard, Andre C.; Shaffer, John W.; and Gavenonis, Thomas L., 4,374,073, Cl. 264-3.00R.

Gay, Benjamin A., to PPG Industries, Inc. Continuous cutter for a glass fiber chopper. 4,373,650, Cl. 225-97.000.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Gehle, Karl; and Schreier, Josef, 4,373,757, Cl. 299-43.000.
Gehle, Karl; and Schreier, Josef, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Conveyor trough for a scraper conveyor for use with a mining machine. 4,373,757, Cl. 299-43.000.
Geiger, John H., Jr.: *See*—
Boden, Richard M.; and Geiger, John H., Jr., 4,374,277, Cl. 568-448.000.
Geil, Ronald J., to Gould Inc. Molded plastic control lock knob with push and/or pull feature. 4,373,405, Cl. 74-531.000.
Geis, William A.; and Frimodig, Carl H., Jr., to Shell Oil Company. Dome funnel. 4,373,547, Cl. 137-377.000.
Geiter, Robert: *See*—
Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., 4,373,507, Cl. 126-289.000.
Gelman Sciences Inc.: *See*—
Davis, William J., 4,374,232, Cl. 525-243.000.
Gelu Reutlinger Steinwerk Gerhard Lutz GmbH: *See*—
Lutz, Gerhard, 4,373,309, Cl. 52-182.000.
Gemmill, Robert M.; and Horodysky, Andrew G., to Mobil Oil Corporation. Lubricant composition containing borated oxazoline friction reducer. 4,374,032, Cl. 252-49.600.
Gendronneau, Claude V. L.: *See*—
Camboulives, Andre A. M. L.; Debeneix, Pierre; Gendronneau, Claude V. L.; and Hugnet, Roger P., 4,373,421, Cl. 184-6.400.
General Dynamics, Pomona Division: *See*—
Dugan, William P., 4,374,003, Cl. 204-11.000.
Piesik, Edward T., 4,373,420, Cl. 89-1.812.
General Electric Company: *See*—
Aneja, Viney P., 4,374,283, Cl. 568-724.000.
Arendt, Ronald H., 4,374,117, Cl. 423-593.000.
Crivello, James V.; and Lee, Julia L., 4,374,066, Cl. 260-440.000.
Dochterman, Richard W., 4,373,696, Cl. 248-604.000.
Ellis, Howard F.; and Fishman, Herbert, 4,374,049, Cl. 252-519.000.
Engeler, William E., 4,374,334, Cl. 307-355.000.
Hayden, Stephen C., 4,373,934, Cl. 51-309.000.
Hiltz, Arnold A.; and Moy, Francis L., 4,374,081, Cl. 264-102.000.
Holmes, David G., 4,373,608, Cl. 181-202.000.
Holub, Fred F.; and Hoback, John T., 4,374,214, Cl. 523-466.000.
Johnson, Peter D., 4,373,391, Cl. 73-335.000.
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., 4,373,272, Cl. 34-57.00A.
Ladusaw, William T., 4,373,352, Cl. 62-196.00C.
Ladusaw, William T., 4,373,882, Cl. 418-270.000.
Loucks, George R.; and Campbell, John R., 4,374,233, Cl. 525-394.000.
Nathan, Bernard D.; and Witter, Donald R., 4,374,005, Cl. 204-15.000.
Noland, Joseph R., 4,373,350, Cl. 62-156.000.
Olashaw, William F.; and Postlethwait, James H., 4,374,405, Cl. 361-355.000.
Peloquin, Arthur V.; and Qurnell, Frank D., 4,374,024, Cl. 210-241.000.
Steigerwald, Robert L.; and Park, John N., 4,374,355, Cl. 320-43.000.
Temple, Victor A. K., 4,374,389, Cl. 357-13.000.
Terhune, James H.; Sturtz, John P.; and Neissel, John P., 4,373,375, Cl. 73-19.000.
General Foods Corporation: *See*—
Cole, Bruce A.; Levine, Harold I.; McGuire, Michael T.; Nelson, Kathleen J.; and Slade, Louise, 4,374,154, Cl. 426-565.000.
Consolazio, George A.; and Pano, Gury, 4,374,063, Cl. 260-118.000.
Lindstrom, Ted R.; and Slade, Louise, 4,374,151, Cl. 426-19.000.
General Motors Corporation: *See*—
Christ, John H., 4,373,871, Cl. 417-310.000.
Coleman, John R., 4,373,333, Cl. 60-578.000.
Cross, William E.; and Plyler, Robert G., 4,373,771, Cl. 339-125.00L.
Hamren, Glen C., 4,373,497, Cl. 123-571.000.
Hayes, John R., 4,373,575, Cl. 165-7.000.
Mathues, Thomas P., 4,373,617, Cl. 192-3.310.
Melinat, Wolfgang, 4,373,615, Cl. 188-73.100.
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Smale, Charles H., 4,373,326, Cl. 60-39.161.
Stark, Terrence L., 4,373,330, Cl. 60-311.000.
Thebert, Glenn W., 4,373,859, Cl. 415-159.000.
Williams, Donald L., 4,373,666, Cl. 237-12.30B.
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Shanoski, Henry, 4,374,238, Cl. 528-50.000.
Genese, Joseph N.: *See*—
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Frieder, Leonard P., Jr., 4,374,301, Cl. 179-1.00R.
George, Davis A.: *See*—
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Bradley, David J.; Gibbs, Dennis D.; Kostuch, Donald J.; and Martin, James S., 4,374,417, Cl. 364-200.000.
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Willis, Jeffrey D.; and Gibney, Nigel P., 4,373,342, Cl. 60-748.000.
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Miller, Leonard A., Jr., 4,373,840, Cl. 414-225.000.
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Gill, Thomas J.: *See*—
Petit, Peter J.; and Gill, Thomas J., 4,373,909, Cl. 432-109.000.
Gilliom, John W., to UMC Industries, Inc. Apparatus for heating food, such as french fried potatoes. 4,374,318, Cl. 219-400.000.
Givler, Omar R., to Portage Electric Products, Inc. Modified contact strip mounting means for thermostatic switches. 4,374,372, Cl. 337-380.000.
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Church, Robert, 4,373,273, Cl. 34-104.000.
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Kreis, Philipp, 4,373,472, Cl. 122-14.000.
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Goldman, Holliday L., to Allis-Chalmers Corporation. Method of manufacturing a wedge gate valve. 4,373,242, Cl. 29-157.10R.
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Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, to Tenneco Chemicals, Inc. Aqueous dispersions of free radical-generating polymerization initiators. 4,374,057, Cl. 252-426.000.
Goodman, Robert B.; and Triba, James T., to United Technologies Corporation. Check valve. 4,373,544, Cl. 137-220.000.
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Boyd, Hugh, 4,373,645, Cl. 222-203.000.
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Declercq, Pierre J. R., 4,373,567, Cl. 152-405.000.
Goof, Sven K. L. Electric contact device. 4,374,374, Cl. 338-114.000.
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Drost, Jim L.; and Gordin, Myron K., 4,374,407, Cl. 362-432.000.
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y. Method for modification of the surface of industrial rubber articles. 4,374,180, Cl. 428-421.000.

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Vervoordt, Joseph P.; and Gorzynski, Joseph J., 4,373,476, Cl. 123-80.00D.
Goscenski, Edward J., Jr., to Eaton Corporation. Flexible shaft fan drive. 4,373,482, Cl. 123-198.00R.
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Gossalter, Rene. Tube sealing in tube bundle heat exchangers. 4,373,580, Cl. 165-173.000.
Goto, Isamu: *See*—
Tomita, Takao; Yamamoto, Hitoshi; Enoki, Shigenaga; Goto, Isamu; and Hashimoto, Takeshi, 4,373,602, Cl. 180-227.000.
Goto, Kaoru: *See*—
Negishi, Hideo; Goto, Kaoru; and Takaya, Sueji, 4,373,839, Cl. 408-59.000.
Goudreau, Noel; Colevris, Nick; and Southard, Carl, to Trico Products Incorporated. Protective chest shield. 4,373,211, Cl. 2-2.000.
Gouesbet, Gerard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for the simultaneous measurement of data, including velocity, relating to submicronic particles in a state of flow in a fluid. 4,373,807, Cl. 356-28.500.
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Geil, Ronald J., 4,373,405, Cl. 74-531.000.
Tekippe, Vincent J.; and Lach, Lawrence E., 4,374,328, Cl. 250-458.100.
Gouronnec, Alain; Regreny, Andre; and Trebeux, Michel. Multiple fiber forming machine. 4,373,943, Cl. 65-10.100.
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Grace, Frederick J. Portable off shore well installation apparatus. 4,373,834, Cl. 405-60.000.
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Schritt, Renaldo F.; and Kenney, Martin J., 4,373,619, Cl. 192-0.090.
Grahl, Paul F. Fishing tip-up. 4,373,287, Cl. 43-17.000.
Gramlich, Walter: *See*—
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Granda, Edward J.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,374,054, Cl. 252-522.00R.
Grandmont, Robert, to 110707 Canada Ltee. Heat recuperating water heating system. 4,373,473, Cl. 122-20.00B.
Grasselli, R. K.: *See*—
Burrington, J. D.; Grasselli, R. K.; and Kartisek, C. T., 4,374,293, Cl. 585-410.000.
Gray, John D.: *See*—
Meetham, Geoffrey W.; and Gray, John D., 4,374,084, Cl. 420-449.000.
Grazen, Alfred E. Method of producing precision abrasive tools. 4,373,933, Cl. 51-309.000.
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Kewanee Industries, Inc. Linear quaternary ammonium polymers. 4,374,244, Cl. 542-476.000.
Greenberger, William, to Hopp Press, Inc., The. Shelf molding clip assembly. 4,373,693, Cl. 248-221.400.
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McCombs, Norman R., 4,373,938, Cl. 55-160.000.
Greener, Brian; Pedder, Simon J.; and Forknall, John P., to SKF (U.K.) Limited. Bearing assemblies for conveyor rollers fitted with end covers. 4,373,759, Cl. 308-187.200.
Greenheck Fan Corporation: *See*—
Neitzel, Emery W.; and Schumacher, Jerome A., 4,373,509, Cl. 126-299.00D.
Greiner, Max; Krieger, Klaus; Schiller, Gottfried; Walk, Wolf-Rudiger; and Walz, Ludwig, to Robert Bosch GmbH. Apparatus for controlling an exhaust recirculation device in internal combustion engines. 4,373,496, Cl. 123-569.000.
Gress, Wolfgang: *See*—
Linden, Heinrich; Bornmann, Hans; Gress, Wolfgang; and Wegemund, Bernd, 4,373,964, Cl. 106-308.00Q.
Greutert, Albert, to Maxs AG. Basket filter. 4,374,026, Cl. 210-493.500.
Grevich, John J. Crusher and separator for cans and bottles. 4,373,435, Cl. 100-49.000.
Gribnau, Thomas C. J.; Roeles, Frits; and Leuvering, Johannes H. W., to Akzona Incorporated. Application of water-dispersible hydrophobic dyes or pigments as labels in immunoassays. 4,373,932, Cl. 436-501.000.
Grogg, Thomas A.: *See*—
Crawford, John P., 4,373,831, Cl. 403-318.000.
Groll, Fritz: *See*—
Schober, Karl; and Groll, Fritz, 4,373,751, Cl. 285-137.00R.
Grooms, John M.: *See*—
Foreman, Brian E.; and Grooms, John M., 4,373,838, Cl. 406-14.000.
Groot, Theodorus C.: *See*—
Bakker, Gijsbertus; and Groot, Theodorus C., 4,373,237, Cl. 445-3.000.
Grout, Kenneth M.; and Presby, David W. Gun muzzle loader. 4,373,285, Cl. 42-90.000.
Grover, Donald D.: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., 4,373,384, Cl. 73-119.00A.
Gruber Systems, Inc.: *See*—
Garasi, Louis A.; and Hayes, Ronald F., 4,373,219, Cl. 4-300.000.
Grundler, Robert; Fuchs, Josef; and Jenni, Herbert, to Aktiengesellschaft Adolph Saurer. Apparatus for picking the shuttles of a loom. 4,373,557, Cl. 139-142.000.
Gryskiewicz, Gregory A.; and Koehler, Raymond A., to UOP Inc. Abrasion resistant, reinforced screen panel member. 4,374,169, Cl. 428-221.000.
GSE, Inc.: *See*—
Barrett, Gary L., 4,373,402, Cl. 73-862.390.
GTE Automatic Electric Laboratories, Inc.: *See*—
Stewart, James A., 4,374,303, Cl. 179-2.08C.
GTE Automatic Electric Labs Inc.: *See*—
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,374,413, Cl. 364-200.000.
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,374,414, Cl. 364-200.000.
Holden, James R., 4,374,361, Cl. 328-120.000.
GTE Laboratories Incorporated: *See*—
Natansohn, Samuel; and Czupryna, Gary, 4,374,008, Cl. 204-109.000.
Schlafer, John, 4,373,781, Cl. 350-96.290.
GTE Products Corporation: *See*—
Hall, Harold H., Jr.; Bouchard, Andre C.; Shaffer, John W.; and Gavenonis, Thomas L., 4,374,073, Cl. 264-3.00R.
Holmes, James L., 4,373,906, Cl. 431-359.000.
Kim, Tai K.; MacInnis, Martin B.; McClintic, Robert P.; and Vogt, Martin C., 4,374,099, Cl. 423-54.000.
Parent, Edward D., 4,373,952, Cl. 75-244.000.
Guibert, Raul, to Sunset Ltd. Counter-top oven. 4,374,319, Cl. 219-400.000.
Guigley, Paul A., to Wm. G. Leininger Knitting Company. Double sock construction. 4,373,215, Cl. 2-239.000.
Guttinger, Heinz, to Escher Wyss Limited. Support element with flexible head portion. 4,373,238, Cl. 29-116.0AD.
Guyette, Richard R.: *See*—
Cormier, Roger L.; Dugan, Robert J.; Guyette, Richard R.; and Wansor, David H., 4,374,415, Cl. 364-200.000.
H. A. Montgomery Co., Inc., The: *See*—
Wojtowicz, Wesley J., 4,374,168, Cl. 428-212.000.
Haag, Werner O.; and Lago, Rudolph M., to Mobil Oil Corporation. Isomerization of paraffin hydrocarbons using zeolites with high steam-enhanced acidity. 4,374,296, Cl. 585-739.000.
Haagen, Peter H.; and Kline, Christopher R., to Tandy Corporation. Ringer system for a telephone. 4,374,307, Cl. 179-84.00T.
Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,373,429, Cl. 99-375.000.
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann. Steam sealing strip for water baking plates. 4,373,429, Cl. 99-375.000.
Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,373,429, Cl. 99-375.000.
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Yoshioka, Nobuyuki; Suzuki, Tsutai; Haba, Masanori; and Koyama, Hideo, 4,374,160, Cl. 427-101.000.
Habisohn, Victor J. Multiple speed control means for a variable speed motor system. 4,374,353, Cl. 318-799.000.
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Pryor, Timothy R.; Hockley, Bernard; Liptay-Wagner, Nick; Hageniers, Omer L.; and Pastorius, W. J., 4,373,804, Cl. 356-1.000.
Hagiz, Yitzchak, to Sharnoa Ltd. Harvesting apparatus for onions. 4,373,589, Cl. 171-31.000.
Hahn, Kurt L.: *See*—
Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,373,370, Cl. 72-349.000.
Hahn, Norbert: *See*—
Hipp, Steven J.; and Hahn, Norbert, 4,373,847, Cl. 414-401.000.
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Halgren, John A.: *See*—
Cellitti, Raymond A.; and Halgren, John A., 4,373,973, Cl. 148-12.400.
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., to Outboard Marine Corporation. Marine propulsion device steering mechanism. 4,373,920, Cl. 440-59.000.
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., to Outboard Marine Corporation. Outboard motor with sequentially operating tilt and trim means. 4,373,921, Cl. 440-61.000.
Hall, Dale R., to B. F. Goodrich Company, The. Stabilization of post-chlorinated vinyl chloride polymers by phosphate salts. 4,374,205, Cl. 521-85.000.

Hall, Harold H., Jr.; Bouchard, Andre C.; Shaffer, John W.; and Gavenonis, Thomas L., to GTE Products Corporation. Method of making a heat-sealed pyrotechnic cap. 4,374,073, Cl. 264-3.00R.

Hall, John B.: *See*—
Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,374,055, Cl. 252-522.00R.

Hall, Michael J.: *See*—
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Hallada, Calvin J.: *See*—
Sebenik, Roger F.; Hallada, Calvin J.; Barry, Henry F.; and Tsigdinos, George A., 4,374,100, Cl. 423-56.000.

Halliburton Company: *See*—
Toellner, Robert L., 4,373,581, Cl. 166-53.000.

Hallstrom, Bengt O. Method of sterilizing mattresses, laundry sacks and similar articles in a sterilizing apparatus. 4,374,087, Cl. 422-34.000.

Hamaker, John D. Inertial guide and support means for sabre saws. 4,373,264, Cl. 30-374.000.

Hammer, Jeffrey M., to Honeywell Inc. Condition control system for efficient transfer of energy to and from a working fluid. 4,373,663, Cl. 236-15.00R.

Hamren, Glen C., to General Motors Corporation. Exhaust gas recirculation control. 4,373,497, Cl. 123-571.000.

Hancock, Ronald D.; and Mackison, Robert, to British Petroleum Company Limited, The. Process for the production of esters in the presence of a heterogeneous esterification catalyst. 4,374,263, Cl. 560-204.000.

Hancor, Inc.: *See*—
Fouss, James L.; Rosenbaum, Larry A.; and Child, James L., Jr., 4,374,079, Cl. 264-46.100.

Haney, James A., to McDermott Incorporated. Removable closure plate. 4,373,835, Cl. 405-195.000.

Hanley, Gerard L.: *See*—
Viola, Raymond D.; and Hanley, Gerard L., 4,374,368, Cl. 333-128.000.

Hansberry, Charles J., Jr. Combined article mover and worker support. 4,373,761, Cl. 312-250.000.

Hansen, Glen D.: *See*—
Buschbom, Floyd E.; and Hansen, Glen D., 4,373,600, Cl. 180-212.000.

Hansen, Kenneth H.; and Conover, Louis S., Jr., to Nolan Systems, Inc. Apparatus for inserting supplementary material into newspaper jackets. 4,373,710, Cl. 270-55.000.

Hanson, Steven P.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Puzzle with rotatable blocks and face portions slidable therebetween. 4,373,729, Cl. 273-153.00S.

Hanson, Timothy A.; and Smith, David W., to Teledyne Industries, Inc. Apparatus for producing porous shaped products. 4,373,887, Cl. 425-143.000.

Haque, Kazi E.: *See*—
Skeaff, James M.; Ritcey, Gordon M.; Haque, Kazi E.; and Lucas, Bernard H., 4,374,096, Cl. 423-9.000.

Hara, Hiroshi: *See*—
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Harada, Hidefumi: *See*—
Uenishi, Toshiaki; Harada, Hidefumi; Sasaki, Katumasa; Akagi, Akio; and Yamasaki, Takanori, 4,373,963, Cl. 106-304.000.

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Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, 4,374,284, Cl. 568-817.000.

Harada, Yoshikazu: *See*—
Masuda, Teruo; Morita, Masayasu; Yamaguchi, Kazuyuki; and Harada, Yoshikazu, 4,373,516, Cl. 128-57.000.

Harding, Robert R.; and Stuermer, Walter L., to Foster Poultry Farms. Poultry cutting machine. 4,373,232, Cl. 17-11.000.

Harle, Anton. Suction bottle for sucking out secretions from wound cavities. 4,373,528, Cl. 128-276.000.

Harmsen, Siegfried: *See*—
Papst, Georg F.; Harmsen, Siegfried; and Wrobel, Gunter, 4,373,861, Cl. 415-213.00C.

Harrell, Richard G.; Glover, Herman L.; and Cain, Gary L., to Cain Food Industries, Inc. Urea yeast food for baking. 4,374,150, Cl. 426-19.000.

Hartman, Don W.: *See*—
Churchill, Richard W.; Hartman, Don W.; Howard, Richard A.; and Markowicz, Victor, 4,373,726, Cl. 273-138.00A.

Hartman, Susan E.: *See*—
McGuckin, Hugh G.; Hartman, Susan E.; and Specht, Donald P., 4,374,194, Cl. 430-199.000.

Hartwig, Walter J.: *See*—
Petit, Peter J.; and Hartwig, Walter J., 4,373,908, Cl. 432-109.000.

Haruta, Masahiro: *See*—
Eida, Tsuyoshi; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Ohta, Tokuya, 4,373,954, Cl. 106-20.000.

Harvey, Richard G.: *See*—
Fallows, John C. J.; and Harvey, Richard G., 4,374,208, Cl. 521-109.000.

Haryu, Satoshi: *See*—
Kishida, Nobuhiro; Shishido, Kunihiro; and Haryu, Satoshi, 4,373,891, Cl. 425-174.400.

Hashimoto, Masaru, to Tokyo Shibaura Denki Kabushiki Kaisha. Constant voltage circuit. 4,374,356, Cl. 323-273.000.

Hashimoto, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Transfer device. 4,373,714, Cl. 271-310.000.

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Tomita, Takao; Yamamoto, Hitoshi; Enoki, Shigenaga; Goto, Isamu; and Hashimoto, Takeshi, 4,373,602, Cl. 180-227.000.

Haskell, Theodore H.; and Hutt, Marland P., to Warner-Lambert Company. Antibacterial amide compounds, compositions, and methods of use. 4,374,138, Cl. 424-258.000.

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Ulrich, Bohdan, 4,373,764, Cl. 339-75.0MP.

Haslinger, Manfred: *See*—
Resele, Peter; and Haslinger, Manfred, 4,373,741, Cl. 280-279.000.

Hatin, Donald T., to RCA Corporation. Video disc stylus cartridge with protective member. 4,374,434, Cl. 369-170.000.

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Steiniger, Wolfgang, 4,373,538, Cl. 131-109.00R.

Haury, Vernon E.: *See*—
Flanagan, Joseph E.; and Haury, Vernon E., 4,373,976, Cl. 149-92.000.

Hausdorfer, Michael, to Robert Bosch GmbH. Chrominance sub-carrier modifier for PAL-color television signals. 4,374,396, Cl. 358-24.000.

Hawkins, James H., to Voorwood Company. Machine for applying transfer foil to a shaped edge of a substrate. 4,373,984, Cl. 156-477.100.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Carburetor for an internal combustion engine. 4,373,485, Cl. 123-340.000.

Hayden, Stephen C., to General Electric Company. Metal bonded diamond aggregate abrasive. 4,373,934, Cl. 51-309.000.

Hayes, John R., to General Motors Corporation. Inboard seal mounting. 4,373,575, Cl. 165-7.000.

Hayes Microcomputer Products, Inc.: *See*—
Heatherington, Dale A., 4,374,411, Cl. 364-200.000.

Hayes, Ronald F.: *See*—
Garasi, Louis A.; and Hayes, Ronald F., 4,373,219, Cl. 4-300.000.

Haynes, Louis E. Carburetor air injection system. 4,373,500, Cl. 123-587.000.

Heatherington, Dale A., to Hayes Microcomputer Products, Inc. Relocatable read only memory. 4,374,411, Cl. 364-200.000.

Hebert, Theodore M.: *See*—
Hebert, Thomas H.; and Hebert, Theodore M., 4,373,346, Cl. 62-79.000.

Hebert, Thomas H.; and Hebert, Theodore M. Precool/subcool system and condenser therefor. 4,373,346, Cl. 62-79.000.

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Hehl, Karl. Mechanical safety cover interlock for injection molding machine. 4,373,890, Cl. 425-153.000.

Heibein, Harry P.: *See*—
Bildstein, Carl R.; Heibein, Harry P.; and Mathews, Harlan P., 4,374,386, Cl. 346-75.000.

Heijting, Hendrik G., to Thomassen & Drijver-Verblifa NV. Hydraulic assist stripping. 4,373,368, Cl. 72-344.000.

Heikkenen, Herman J. Method for determining the age or authenticity of timber structures. 4,373,393, Cl. 73-432.00R.

Heikkinen, Leo L. Self-propelled wood processing apparatus. 4,373,564, Cl. 144-366.000.

Heilen, Gerd; Halbritter, Klaus; and Gramlich, Walter, to BASF Aktiengesellschaft. Preparation of α-methylsubstituted carbonyl compounds. 4,374,274, Cl. 568-313.000.

Heinsohn, George E., to Du Pont de Nemours, E. I., and Company. Method for production of methylamines. 4,374,273, Cl. 564-479.000.

Heinz, Theodore A., to Rockwell International Corporation. Differential screw actuator. 4,373,404, Cl. 74-424.80B.

Heinzl, Joachim, to Siemens Aktiengesellschaft. Method and an arrangement for depicting a half-tone image. 4,374,388, Cl. 346-140.00R.

Heinzle, August. Feed arrangement for textile machines. 4,373,457, Cl. 112-96.000.

Helene Curtis Industries, Inc.: *See*—
Newell, Gerald P., 4,374,125, Cl. 424-70.000.

Heller, Carl A.; and Murbach, Warren J., to United States of America, Navy. Process of making a holographic optical article. 4,374,189, Cl. 430-2.000.

Hellmer, George A. Drive mechanism employing wrapped-spring clutch as radial load-bearing means. 4,373,621, Cl. 192-81.00C.

Helm, Arthur E.: *See*—
Brown, George E. R.; Helm, Arthur E.; and Keane, Stuart, 4,373,723, Cl. 273-86.00B.

Hemery, Jacques; and Roger, Bernard P., to U.S. Philips Corporation. Darlington amplifier with excess-current protection. 4,374,364, Cl. 330-298.000.

Hemex, Inc.: *See*—
Klawitter, Jerome J., 4,373,216, Cl. 3-1.500.

Hemmer, Valentine J.: *See*—
Piscitelli, R. Amelia; Hemmer, Valentine J.; Fischer, Charles P.; and Shepler, Eric F., 4,373,773, Cl. 339-262.00R.

Hemmila, Ilkka: *See*—
Soini, Erkki; and Hemmila, Ilkka, 4,374,120, Cl. 436-546.000.

Hendrix, Willie J. Three-wheel vehicle. 4,373,740, Cl. 280-269.000.

Henke, Donald L., to Veda, Inc. Animal feed transport and self-unloading vehicle. 4,373,845, Cl. 414-326.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Linden, Heinrich; Bornmann, Hans; Gress, Wolfgang; and Wegemund, Bernd, 4,373,964, Cl. 106-308.00Q.

Henn, Billie R. Riding animal device for children. 4,373,715, Cl. 272-1.00R.

Henry, Arnold W.; Azar, Jack C.; and Sagal, John, Jr., to Xerox Corporation. Fusing member for electrostatographic copiers. 4,373,239, Cl. 29-132.000.

Hepp, James. Lightweight attachment for solar cell array next to a fluorescent tube. 4,374,406, Cl. 362-253.000.

Herberholz, Klaus; and Schmidt, Peter. Lifting device for the transportation of flasks. 4,373,755, Cl. 294-67.00R.

Herbert, M. Linton. Underwater vision device. 4,373,788, Cl. 351-43.000.

Hermes Precisa International S.A.: *See*—
Costa, Jorge, 4,373,708, Cl. 267-136.000.

Herrman, Bradley D.: *See*—
Cannon, Jack W.; Herrman, Bradley D.; and Ramirez, Ramiro, Jr., 4,374,429, Cl. 364-900.000.

Herrmann, Carlo L.; and Ott, Granville E., to Texas Instruments Incorporated. Video system with picture information and logic signal multiplexing. 4,374,395, Cl. 358-22.000.

Herz, Arthur H., to Eastman Kodak Company. Silver halide emulsions containing latent image stabilizing compounds. 4,374,196, Cl. 430-505.000.

Herzog, Rollie R.: *See*—
Stamp, Custis L., Jr.; Herzog, Rollie R.; and Brennan, Michael A., 4,373,351, Cl. 62-160.000.

Hess, Susan V., to Amchem Products, Inc. Coating composition. 4,373,968, Cl. 148-6.200.

Hetherington, Roy, Jr.: *See*—
Roper, Charles R., Jr.; Strattan, John K.; Hetherington, Roy, Jr.; and Hiller, Austin J., 4,373,967, Cl. 148-2.000.

Hetrick, Earl C.; and Winter, Donald T., to Koppers Company, Inc. Ascension pipe heat shield. 4,373,998, Cl. 202-258.000.

Hettich, Allen J. Oil heater. 4,373,905, Cl. 431-330.000.

Hettinger, William P., Jr.; and Kovach, Stephen M., to Ashland Oil, Inc. Process for cracking high-boiling hydrocarbons using high ratio of catalyst residence time to vapor residence time. 4,374,019, Cl. 208-120.000.

Hewlett-Packard Company: *See*—
Nalepa, Roger A.; and Casale, Michael A., 4,373,549, Cl. 137-487.500.

Heybourn, Frank: *See*—
Molins, Desmond W.; Hinchcliffe, Dennis; Heybourn, Frank; and Coyte, Raymond G., 4,373,624, Cl. 198-347.000.

Higo, Moriaki: *See*—
Toda, Haruhiko; Higo, Moriaki; Saga, Hitoshi; and Shinbo, Masafu, 4,374,292, Cl. 585-360.000.

Higuchi, Mitsuo, to Fujitsu Limited. Semiconductor PROM device. 4,374,430, Cl. 365-104.000.

Hilge, Bernhard: *See*—
Elhaus, Friedrich W.; and Hilge, Bernhard, 4,373,706, Cl. 266-252.000.

Hill, Bruce C.; and Stern, Roger A., to Palo Alto Medical Research Foundation. Ultrasonic marker for physiologic diagnosis and method of using same. 4,373,532, Cl. 128-660.000.

Hill, Jack; Sharp, Brian W.; Warburton, Dennis; Walker, Robert B., deceased; and by Walker, Thomas, administrator, to May & Baker Limited. Pyrimidine derivatives. 4,374,136, Cl. 424-251.000.

Hill, Phillip D.: *See*—
Tusinski, Joseph; and Hill, Phillip D., 4,373,298, Cl. 51-105.0LG.

Hillebrand, George A.: *See*—
Buente, Stephen M.; and Hillebrand, George A., 4,373,477, Cl. 123-90.550.

Hiller, Austin J.: *See*—
Roper, Charles R., Jr.; Strattan, John K.; Hetherington, Roy, Jr.; and Hiller, Austin J., 4,373,967, Cl. 148-2.000.

Hiltenbrand, Richard E.: *See*—
Schoenfelder, George A.; Rork, Gerald D.; and Hiltenbrand, Richard E., 4,374,329, Cl. 250-574.000.

Hiltz, Arnold A.; and Moy, Francis L., to General Electric Co. Cure of epoxy systems at reduced pressures. 4,374,081, Cl. 264-102.000.

Hinchcliffe, Dennis: *See*—
Molins, Desmond W.; Hinchcliffe, Dennis; Heybourn, Frank; and Coyte, Raymond G., 4,373,624, Cl. 198-347.000.

Hinn, John S., to Airco, Inc. Methods and apparatus for producing refrigeration. 4,373,344, Cl. 62-62.000.

Hipp, Steven J.; and Hahn, Norbert, to Rite-Hite Corporation. Releasable locking device. 4,373,847, Cl. 414-401.000.

Hirai, Atuo: *See*—
Kamei, Shigeki; Fushio, Masamori; and Hirai, Atuo, 4,373,433, Cl. 100-37.000.

Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, to Bridgestone Tire Co., Ltd. Pneumatic radial tire having a reduced rolling resistance. 4,373,566, Cl. 152-353.00G.

Hirasawa, Kiyosi: *See*—
Kawakubo, Takamasa; and Hirasawa, Kiyosi, 4,374,225, Cl. 524-302.000.

Hirashima, Tsuneaki; and Miyata, Toshiyuki, to Osaka Municipal Government. Method of producing benzimidazolone. 4,374,250, Cl. 548-305.000.

Hirose, Masaaki, to Takeda Riken Kogyo Kabushiki Kaisha. Apparatus for measuring the oscillation frequency of a voltage controlled oscillator. 4,374,358, Cl. 324-78.00D.

Hirota, Hajime: *See*—
Watanabe, Hiroshi; and Hirota, Hajime, 4,374,056, Cl. 252-546.000.

Hiroyuki, Nagai: *See*—
Yamashita, Akira; and Hiroyuki, Nagai, 4,374,398, Cl. 358-143.000.

Hirt, Alfred, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method and apparatus for protecting an arrangement located in an area of highly concentrated radiation. 4,373,512, Cl. 126-418.000.

Hitachi Cable, Ltd.: *See*—
Tatsumi, Aritaka, 4,373,366, Cl. 72-75.000.

Hitachi Kiden Kogyo, Ltd.: *See*—
Kamei, Shigeki; Fushio, Masamori; and Hirai, Atuo, 4,373,433, Cl. 100-37.000.

Hitachi Koki Co., Ltd.: *See*—
Mukoh, Akio; Morishita, Hirosada; Anzai, Masayasu; Tokunaga, Kazuyoshi; and Kikuchi, Yasuo, 4,374,191, Cl. 430-100.000.

Hitachi, Ltd.: *See*—
Kosa, Yasunobu; and Komori, Kazuhiro, 4,373,249, Cl. 29-571.000.
Misono, Masayoshi; and Kitamura, Shigeki, 4,374,344, Cl. 313-479.000.
Mukoh, Akio; Morishita, Hirosada; Anzai, Masayasu; Tokunaga, Kazuyoshi; and Kikuchi, Yasuo, 4,374,191, Cl. 430-100.000.
Nanba, Mitsuo; Ogirima, Masahiko; Kozuka, Hirotsugu; and Shintani, Akira, 4,373,975, Cl. 148-189.000.
Narato, Kiyoshi; Ohtsuka, Keizo; and Niwa, Sadahiko, 4,373,376, Cl. 73-23.100.
Nishimura, Yutaka; Kuroiwa, Hiroshi; Kirisawa, Tadashi; and Oyama, Yoshishige, 4,373,387, Cl. 73-204.000.
Obara, Sanshiro; and Miyashita, Ikuro, 4,373,379, Cl. 73-40.50R.
Tanimoto, Sunao; Tanifuji, Shinya; and Morooka, Yasuo, 4,373,364, Cl. 72-8.000.

Hitachi Shipbuilding & Engineering Company Limited: *See*—
Kobayashi, Takanobu, 4,373,316, Cl. 53-67.000.

Hoback, John T.: *See*—
Holub, Fred F.; and Hoback, John T., 4,374,214, Cl. 523-466.000.

Hoch, Samuel: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,374,057, Cl. 252-426.000.

Hochschild, Richard. Method for making a pharmaceutical and/or nutritional dosage form. 4,374,082, Cl. 264-129.000.

Hockley, Bernard: *See*—
Pryor, Timothy R.; Hockley, Bernard; Liptay-Wagner, Nick; Hageniers, Omer L.; and Pastorius, W. J., 4,373,804, Cl. 356-1.000.

Hodgdon, Russell B.: *See*—
MacDonald, Russel J.; and Hodgdon, Russell B., 4,374,206, Cl. 521-38.000.

Hoechst Aktiengesellschaft: *See*—
Geuss, Reinhart, 4,374,281, Cl. 568-637.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Davis, Larry; and Klein, Joseph T., 4,374,245, Cl. 546-20.000.
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,374,137, Cl. 424-258.000.
Lee, Thomas B. K.; and Lee, George E., 4,374,067, Cl. 260-456.00A.

Hoffman, Kenneth: *See*—
Zwick, Eugene B.; Nguyen, Dung D.; Brigham, William D.; and Hoffman, Kenneth, 4,373,896, Cl. 431-9.000.

Hoffman, Louis S. Container. 4,373,636, Cl. 206-551.000.

Hoffmann, Erich; and Ptaschek, Werner, to W. C. Heraeus GmbH. Apparatus for controlling the absorption of one or more color components in a dyeing fluid. 4,374,322, Cl. 250-226.000.

Hoffmann-La Rocche Inc.: *See*—
Horecker, Bernard L., 4,374,197, Cl. 435-68.000.

Hoffmann-La Roche Inc.: *See*—
Dotz, Karl H., 4,374,290, Cl. 585-16.000.
Mohacsi, Ernest, 4,374,139, Cl. 424-260.000.
Wick, Alexander E., 4,374,261, Cl. 560-51.000.

Hogan, John P.: *See*—
Stricklen, Phil M.; and Hogan, John P., 4,374,234, Cl. 526-105.000.

Hoggins, James T.: *See*—
Ruszala, Ferdinand A.; Hoggins, James T.; and Hupp, Stephen S., 4,374,109, Cl. 423-311.000.

Hohnen Oil Co., Ltd.: *See*—
Miyake, Kanichi; Tokuda, Masahiro; Aoki, Takaaki; Miyakawa, Hideaki; and Tamura, Yasuo, 4,374,217, Cl. 524-47.000.

Hokushin Elect. Works, Ltd.: *See*—
Sekiguchi, Toshio, 4,373,400, Cl. 73-861.120.

Holcroft & Company: *See*—
Jayaraman, Viswanath; and Cone, Carroll, 4,373,702, Cl. 266-111.000.

Holden, James R., to GTE Automatic Electric Labs Inc. Clock failure monitor circuit employing counter pair to indicate clock failure within two pulses. 4,374,361, Cl. 328-120.000.

Holenstein, Ernst; and Ramseier, Paul, to Bracker AG. Method and device for removing a ring traveller from the ring of a ring-spinning or ring-twisting frame. 4,373,247, Cl. 29-426.600.

Holesha, John, to Siemens Corporation. I-Use indication in a telephone keyset. 4,374,308, Cl. 179-99.0LS.

Holland, Larry D., to NEHA International. Method for recovering precious metals. 4,374,097, Cl. 423-22.000.

Hollandsche Beton Groep N.V.: *See*—
van der Pot, Barend J. G., 4,373,338, Cl. 60-641.700.

Hollingsworth, Calvin R. Valve for use with flexible dispensing tube. 4,373,647, Cl. 222-528.000.

Holman, William P. Center mask-perspective photography. 4,373,794, Cl. 354-122.000.

Holmen, Hans K., to A/S Tele-Plan. Movement compensation arrangement. 4,373,332, Cl. 60-426.000.

Holmes, David D., to RCA Corporation. Television ghost cancellation system with ghost carrier phase compensation. 4,374,400, Cl. 358-167.000.

Holmes, David G., to General Electric Company. Tuned sound barriers. 4,373,608, Cl. 181-202.000.
Holmes, James L., to GTE Products Corporation. Multi-lamp photoflash unit and fabricating process. 4,373,906, Cl. 431-359.000.
Holt, Harley R., to Bunker Ramo Corporation. Apparatus for assembling electrical cables to electrical connectors. 4,373,372, Cl. 72-406.000.
Holub, Fred F.; and Hoback, John T., to General Electric Company. Imide containing blends and polymeric compositions prepared therefrom. 4,374,214, Cl. 523-466.000.
Holubka, Joseph W.: *See*—
Dickie, Ray A.; Holubka, Joseph W.; and Qaderi, S. Burhan A., 4,374,213, Cl. 523-416.000.
Homeier, Edwin H.: *See*—
Imai, Tamotsu; and Homeier, Edwin H., 4,374,287, Cl. 568-909.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Okubo, Kiyokazu, 4,373,407, Cl. 74-650.000.
Onda, Takanori; Kawasaki, Hiroshi; and Misawa, Mitsukuni, 4,373,601, Cl. 180-226.000.
Tomita, Takao; Yamamoto, Hitoshi; Enoki, Shigenaga; Goto, Isamu; and Hashimoto, Takeshi, 4,373,602, Cl. 180-227.000.
Honeywell Inc.: *See*—
Bassett, William W.; and Rask, Dean R., 4,373,662, Cl. 236-10.000.
Bohan, John E., Jr., 4,373,898, Cl. 431-73.000.
Hammer, Jeffrey M., 4,373,663, Cl. 236-15.00R.
Lin, Jacob W.; and Weinman, Leslie S., 4,374,179, Cl. 428-411.000.
McClure, B. Thompson, 4,374,090, Cl. 422-98.000.
Mueller, Dale A., 4,373,349, Cl. 62-156.000.
Torborg, Ralph H., 4,373,897, Cl. 431-20.000.
van Dyke, Martin J.; Colby, Dwight D.; and Dougherty, William R., 4,373,390, Cl. 73-304.00C.
Hoogovens IJmuiden B.V.: *See*—
Olivierse, Jan; and van Es, Machiel A. H., 4,373,320, Cl. 53-589.000.
Hooker, Donald E.; and Tojza, Roman A., to Bally Manufacturing Corporation. Variable speed gaming device. 4,373,727, Cl. 273-143.00R.
Hopp Press, Inc., The: *See*—
Greenberger, William, 4,373,693, Cl. 248-221.400.
Horecker, Bernard L., to Hoffmann-La Rocche Inc. Process for thymosin α_1. 4,374,197, Cl. 435-68.000.
Horey, Leonard I.: *See*—
Dunn, William H.; Garron, Stephen A.; Horey, Leonard I.; and Wurst, John W., 4,373,459, Cl. 112-158.00E.
Horler, Hansulrich; and Meier, Erwin, to BBC Brown, Boveri & Company, Limited. Internal combustion engine having a turbo-supercharger with an automatic bypass. 4,373,336, Cl. 60-606.000.
Horner, Michael; and Teege, Gernot, to BASF Aktiengesellschaft. Chroman-6-ol derivatives useful for stabilizing plastics. 4,374,258, Cl. 549-407.000.
Hornkohl, Owen T.: *See*—
Matlock, Gordon E.; and Hornkohl, Owen T., 4,373,652, Cl. 227-100.000.
Horodysky, Andrew G.: *See*—
Gemmill, Robert M.; and Horodysky, Andrew G., 4,374,032, Cl. 252-49.600.
Horton, John D., to Sonoco Products Company. Method of making composite container with compressed body wall. 4,373,928, Cl. 493-103.000.
Houts, Ronald C.: *See*—
Burlage, Donald W.; and Houts, Ronald C., 4,374,426, Cl. 364-724.000.
Howard, James L.: *See*—
Prengaman, Raymond D.; and Howard, James L., 4,373,654, Cl. 228-173.00R.
Howard, Richard A.: *See*—
Churchill, Richard W.; Hartman, Don W.; Howard, Richard A.; and Markowicz, Victor, 4,373,726, Cl. 273-138.00A.
Howell, John R.; and Peng, C. S. Patrick, to Board of Regents, University of Texas System. Hybrid double-absorption cooling system. 4,373,347, Cl. 62-112.000.
Howitt, Ronald W. Prefabricated building units. 4,373,304, Cl. 52-73.000.
Howorth, Jonathan R., to English Electric Valve Company Limited. Image intensifier arrangement with an in situ formed output filter. 4,374,325, Cl. 250-213.0VT.
Hozeski, Kenneth W.: *See*—
Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,373,692, Cl. 248-162.100.
Hsu, Ed C.; Moore, L. Dow; and Temple, Chester S., to PPG Industries, Inc. Aqueous sizing composition for glass fibers and sized glass fibers for thermoplastic reinforcement. 4,374,177, Cl. 428-392.000.
Hsu, Feng H.: *See*—
Cox, Gordon F. N.; and Hsu, Feng H., 4,373,836, Cl. 405-217.000.
Hubtex Maschinenbau GmbH: *See*—
Schultheis, Hans-Werner, 4,373,854, Cl. 414-742.000.
Huckler, Volker D.: *See*—
Benedek, Vasile; and Huckler, Volker D., 4,373,409, Cl. 74-745.000.
Hughes Aircraft Company: *See*—
Lau, Kreisler S. Y., 4,374,291, Cl. 585-320.000.
Wragg, Robert, 4,373,282, Cl. 40-546.000.
Hugnet, Roger P.: *See*—
Camboulives, Andre A. M. L.; Debeneix, Pierre; Gendronneau, Claude V. L.; and Hugnet, Roger P., 4,373,421, Cl. 184-6.400.
Huijsing, Johan H.: *See*—
Schuddemat, Jacob P.; and Huijsing, Johan H., 4,373,386, Cl. 73-189.000.
Hult, Tore M.: *See*—
Lombardi, John P.; Hult, Tore M.; and Trowbridge, Robert H., Jr., 4,373,720, Cl. 273-29.00A.
Hummel-Newell, Robert: *See*—
Ashford, David W.; and Hummel-Newell, Robert, 4,373,916, Cl. 434-22.000.
Hunt, William C., III, to Mobil Oil Corporation. Method of solvent flooding to recover viscous oils. 4,373,586, Cl. 166-263.000.
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Nitrophenylhydrazine compounds. 4,374,271, Cl. 564-310.000.
Hupp, Stephen S.: *See*—
Ruszala, Ferdinand A.; Hoggins, James T.; and Hupp, Stephen S., 4,374,109, Cl. 423-311.000.
Hur, John Y., to AM International, Inc. Erasable intermediate diazotype paper. 4,374,190, Cl. 430-19.000.
Hurst, Ronald C.: *See*—
Yates, Barrie J.; and Hurst, Ronald C., 4,374,113, Cl. 423-445.000.
Husson, Alan L.: *See*—
Caputo, William R.; and Husson, Alan L., 4,373,612, Cl. 187-29.00R.
Hutchins, Erle M., to Western Electric Company, Incorporated. Tool for removing cover from electrical connector. 4,373,258, Cl. 29-764.000.
Hutchinson, George M.; and Burchette, Robert L., Jr., to LHP Corporation. Strand carrier. 4,373,685, Cl. 242-118.600.
Hutchinson, William J., to Eastman Kodak Company. Instant filmstrip with an elastic cover. 4,374,195, Cl. 430-499.000.
Hutt, Marland P.: *See*—
Haskell, Theodore H.; and Hutt, Marland P., 4,374,138, Cl. 424-258.000.
Hutter & Schranz Bautechnik Gesellschaft m.b.H.: *See*—
Artweger, Wolfgang, 4,373,311, Cl. 52-282.000.
Hyatt, James R. Stove with co-axial vent and flue design. 4,373,506, Cl. 126-67.000.
Hydril Company: *See*—
Bollfrass, Charles A.; Landriault, Leonard S.; and McDonald, Patrick E., 4,373,754, Cl. 285-334.000.
Hymatic Engineering Company Limited, The: *See*—
Adams, Norman H.; and Campbell, David N., 4,373,357, Cl. 62-514.0JT.
Ibrahim, Fayez; and Bowman, Edward, to Tyler Refrigeration Corporation. Energy saving refrigeration system. 4,373,348, Cl. 62-115.000.
Ichiko Industries Limited: *See*—
Shimura, Kiichiro; Tamura, Takeo; Kido, Takayoshi; Hara, Hiroshi; and Tanaka, Morimasa, 4,374,348, Cl. 318-443.000.
ICI Australia Limited: *See*—
McGarry, Errol J., 4,374,264, Cl. 560-205.000.
Iga, Atsushi: *See*—
Oshima, Mitsuaki; Neichi, Yutaka; Iga, Atsushi; and Wada, Ryoichi, 4,374,403, Cl. 360-113.000.
Igoe, Robert S.; and Taylor, Richard J., to Merck & Co. Inc. Yogurt milk shake. 4,374,155, Cl. 426-569.000.
Iguchi, Mitsuya: *See*—
Date, Takasaburo; Maki, Toshimichi; Iguchi, Mitsuya; Iwamaru, Sumifusa; and Watanabe, Hisashi, 4,373,911, Cl. 432-152.000.
Iinuma, Kazuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic diagnosing apparatus. 4,373,533, Cl. 128-663.000.
Iio, Toshimasa; and Ohkubo, Toyokazu, to Sumitomo Metal Mining Co., Ltd. Method of concentrating silver from anode slime. 4,374,098, Cl. 423-27.000.
Ikeda, Nobumasa: *See*—
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,373,566, Cl. 152-353.00G.
Ikesue, Haruyuki, to NSK-Warner K.K. Method for coupling stranded cable assembly to fitting coupled arrangement obtained thereby. 4,373,830, Cl. 403-284.000.
Illinois Railway Equipment Company: *See*—
Adler, Franklin P.; and Nadherny, Rudolph E., 4,373,841, Cl. 410-34.000.
Illinois Tool Works Inc.: *See*—
Bettini, John E.; and Nelson, John F., 4,373,842, Cl. 411-377.000.
Edwards, Bryant, 4,373,634, Cl. 206-520.000.
Peterson, Francis C., 4,373,694, Cl. 248-246.000.
Imai, Hirosuke: *See*—
Yuasa, Hitoshi; and Imai, Hirosuke, 4,374,243, Cl. 528-422.000.
Imai, Tamotsu; and Homeier, Edwin H., to UOP Inc. Synthesis of alcohols. 4,374,287, Cl. 568-909.000.
Imperial Chemical Industries Limited: *See*—
Rothwell, Geoffrey R., 4,373,930, Cl. 8-527.000.
Imperial Group Limited: *See*—
Tipper, Derrick W., 4,373,806, Cl. 356-23.000.
Inaba, Hajimu; and Miyashita, Hideo, to Fujitsu Fanuc Limited. Control system for an industrial robot. 4,374,349, Cl. 318-568.000.
Inagaki, Mitsuo: *See*—
Tanaka, Taro; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,373,880, Cl. 418-150.000.
Inai, Masayuki: *See*—
Yoshizaki, Osamu; and Inai, Masayuki, 4,374,385, Cl. 346-1.100.
Inami, Nobuo; and Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Cascade type CMOS semiconductor device. 4,374,332, Cl. 307-304.000.
Inamori, Kazuo; and Miyawaki, Kiyoshige, to Kyoto Ceramic Co., Ltd. Semiconductor integrated circuit supporter having a heating element. 4,374,316, Cl. 219-209.000.

Inamoto, Hiroshi; Sobajima, Katsunobu; and Miyoshi, Shoichi, to Nissan Motor Co., Ltd.; and Kato Hatsujo Kaisha, Ltd. Fastener assembly. 4,373,826, Cl. 403-14.000.
Inamoto, Yoshiaki: *See*—
Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, 4,374,052, Cl. 252-522.00R.
Indy Electronics, Inc.: *See*—
Schroeder, Jon M., 4,374,080, Cl. 264-102.000.
Ing. C. Olivetti & C. S.p.A.: *See*—
Albrile, Walter, 4,373,823, Cl. 400-196.100.
Ingle, William M.: *See*—
Darnell, Robert D.; and Ingle, William M., 4,374,110, Cl. 423-342.000.
Innacelli, Frank L. Tobacco smoke filter. 4,373,539, Cl. 131-209.000.
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Davis, C. Paul, 4,374,404, Cl. 360-128.000.
Innovative Electronics, Inc.: *See*—
Ponto, Robert; and Martin, Hardison G., 4,374,300, Cl. 179-1.0AT.
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Anderson, Gerald L.; Borders, Harley A.; and Aquino, Maria R., 4,374,105, Cl. 423-230.000.
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Ng, Henry H.; and Schmidt, Frederick R., 4,374,381, Cl. 340-711.000.
Interchem International S.A.: *See*—
Rowlands, Jeffrey P., 4,374,209, Cl. 521-116.000.
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Adham, Jawad F., 4,373,778, Cl. 350-96.200.
Barclay, Donald J.; and Vigar, James M. L., 4,374,007, Cl. 204-51.000.
Bernier, William E., 4,374,001, Cl. 204-2.000.
Bildstein, Carl R.; Heibein, Harry P.; and Mathews, Harlan P., 4,374,386, Cl. 346-75.000.
Bradley, David J.; Gibbs, Dennis D.; Kostuch, Donald J.; and Martin, James S., 4,374,417, Cl. 364-200.000.
Cannon, Jack W.; Herrman, Bradley D.; and Ramirez, Ramiro, Jr., 4,374,429, Cl. 364-900.000.
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Cunningham, Joseph E., Jr.; and Gianos, Philip T., 4,374,321, Cl. 219-497.000.
Kim, Sang U., 4,373,966, Cl. 148-1.500.
Polk, Darryl R.; and Williams, Errol R., Jr., 4,374,383, Cl. 340-870.370.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; and Tyszkiewicz, Theodore J., 4,374,276, Cl. 568-398.000.
Boden, Richard M.; and Geiger, John H., Jr., 4,374,277, Cl. 568-448.000.
Klemarczyk, Philip T.; Belko, Robert P.; and Boden, Richard M., 4,374,053, Cl. 252-522.00R.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,374,054, Cl. 252-522.00R.
Luccarelli, Domenick, Jr.; and Yoshida, Takao, 4,374,123, Cl. 424-49.000.
Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,374,055, Cl. 252-522.00R.
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Allori, Aldo; Koutsky, Ronald A.; and Wilger, John A., 4,374,375, Cl. 340-52.00A.
Cellitti, Raymond A.; and Halgren, John A., 4,373,973, Cl. 148-12.400.
Klem, John E., 4,373,739, Cl. 280-111.000.
McMillen, Russell G., 4,373,577, Cl. 165-122.000.
Shekleton, Jack R., 4,373,325, Cl. 60-39.060.
Swanson, William C., 4,373,669, Cl. 239-124.000.
Westerfield, Lawerence D., 4,373,456, Cl. 111-88.000.
International Shoe Machine Corporation: *See*—
Becka, Michael M., 4,373,467, Cl. 118-211.000.
International Standard Electric Corporation: *See*—
Fricke, Hans; Kiess, Jurgen; and Schulmeyer, Lutz, 4,373,691, Cl. 246-34.0CT.
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Borsuk, Leslie M.; and Corrales, Patrick G., 4,373,777, Cl. 350-96.200.
Gasparian, George A., 4,373,775, Cl. 350-96.150.
Severeid, David E.; and Jech, Daryl D., 4,374,027, Cl. 210-608.000.
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Boutteville, Raymond; and Febvret, Thierry, 4,373,385, Cl. 73-146.500.
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MacDonald, Russel J.; and Hodgdon, Russell B., 4,374,206, Cl. 521-38.000.
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Missout, Gilles, 4,374,359, Cl. 324-96.000.
Isenberg, Arnold O., to Westinghouse Electric Corp. Method of vapor deposition. 4,374,163, Cl. 427-253.000.
Isenberg, Arnold O.: *See*—
Somers, Edward V.; and Isenberg, Arnold O., 4,374,184, Cl. 429-17.000.
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Ishii, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for elevator. 4,373,610, Cl. 187-29.00R.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Tachimoto, Kazuo; and Tanoue, Toyosuke, 4,373,883, Cl. 425-8.000.
Ishioka, Yoshimichi: *See*—
Morishita, Teru; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,373,672, Cl. 239-703.000.
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Ito, Haruo: *See*—
Kajikawa, Shuji; Kanai, Kazuo; and Ito, Haruo, 4,373,907, Cl. 432-83.000.
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Ito, Toshihiko: *See*—
Yamamoto, Shinichi; and Ito, Toshihiko, 4,373,895, Cl. 425-461.000.
Itoh, Fukusaburo, to Sharp Kabushiki Kaisha. Fixing temperature selecting control in a copying machine. 4,373,801, Cl. 355-14.0FU.
Itoh Metal Abrasive Co., Ltd.: *See*—
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,374,074, Cl. 264-8.000.
Iwamaru, Sumifusa: *See*—
Date, Takasaburo; Maki, Toshimichi; Iguchi, Mitsuya; Iwamaru, Sumifusa; and Watanabe, Hisashi, 4,373,911, Cl. 432-152.000.
Iwao, Kumiy R.; and Lovie, James V., to Varian Associates, Inc. Chromatographic accessory incorporating injection switch assembly. 4,374,089, Cl. 422-70.000.
Iwata Air Compressor Manufacturing Company Ltd.: *See*—
Matsushita, Yoshio, 4,373,881, Cl. 418-195.000.
Iyengar, Doreswamy R., to BASF Wyandotte Corporation. Surface treated alkali blue pigment. 4,373,962, Cl. 106-288.00Q.
Iyoda, Tetsuo; and Kikuchi, Masatsugu, to Fuji Xerox Co., Ltd. Deflecting device in ink jet printer. 4,374,387, Cl. 346-75.000.
J. I. Case Company: *See*—
Maurer, Herman J., 4,373,852, Cl. 414-723.000.
Nelson, Carl D., 4,373,603, Cl. 180-236.000.
Jackson, Auzville, Jr.: *See*—
Barker, Charles E.; Cairo, Anthony C.; Bauer, Frederick T.; and Jackson, Auzville, Jr., 4,373,664, Cl. 236-46.00R.
Jackson, Priscilla H. Educational device for teaching arithmetical operations. 4,373,917, Cl. 434-209.000.
Jackson, Robert R.: *See*—
Purdy, Geoffrey H.; and Jackson, Robert R., 4,373,756, Cl. 297-153.000.
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Tielemans, Peter A. W.; and Jacobs, Cornelis A. J., 4,374,339, Cl. 313-218.000.
Jaisinghani, Rajan A., to Nelson Industries, Inc. Regenerative filter. 4,374,029, Cl. 210-671.000.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM Aktiebolag. Amorphous, drawn, cup-like thermoplastic PET element of 10-25% crystallinity and monoaxial orientation in side wall. 4,374,166, Cl. 428-35.000.
James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,373,893, Cl. 425-222.000.
James L. Taylor Mfg. Co.: *See*—
Mortoly, John L., 4,374,165, Cl. 427-430.100.
Jamestown Group: *See*—
Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., 4,373,507, Cl. 126-289.000.
Janome Sewing Machine Co. Ltd.: *See*—
Sano, Yasuro, 4,373,461, Cl. 112-274.000.
Janos, Alfred G., to Maysteel Corporation. Guide apparatus for flexible elements connected to relatively moving units. 4,373,324, Cl. 59-78.100.
Jansen, Johann J.: *See*—
Bomers, Joseph J. P.; Ellis, David G.; Jansen, Johann J.; and Bijen, Jan M. J. M., 4,373,981, Cl. 156-164.000.
Japan Exlan Co., Ltd.: *See*—
Tanaka, Koji, 4,374,175, Cl. 428-369.000.
Jarcho, Michael, to Sterling Drug Inc. Dental plaque-preventive oxazolidine containing compositions and method. 4,374,124, Cl. 424-54.000.
Jayaraman, Viswanath; and Cone, Carroll, to Holcroft & Company. Jet impingement/radiant heating apparatus. 4,373,702, Cl. 266-111.000.
Jech, Daryl D.: *See*—
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Jenni, Herbert: *See*—
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Jensen, Wayne D.: *See*—
Kao, James T. F.; and Jensen, Wayne D., 4,374,254, Cl. 548-527.000.
Jernqvist, Ake; and Bolmstedt, Ulf, to Alfa-Laval AB. Plate heat exchanger. 4,373,579, Cl. 165-167.000.
Jezbera, Val K. Hammer bank assembly. 4,373,440, Cl. 101-93.340.
Jha, Mahesh C.: *See*—
Lussiez, Guy W.; and Jha, Mahesh C., 4,374,101, Cl. 423-150.000.
Jimmy Connors Rally Champion Enterprise: *See*—
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John Zink Company: *See*—
Reed, Robert D.; and Schwartz, Robert E., 4,373,902, Cl. 431-202.000.
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McCartney, Joseph F.; Jones, Thomas E.; and Johnson, Leopold J., 4,374,186, Cl. 429-154.000.
Johnson, Melvin C., to American Cyanamid Company. Compositions containing anorexigenic compounds and methods for regulating the feed intake of homothermic animals. 4,374,135, Cl. 424-251.000.
Johnson, Peter D., to General Electric Company. Relative humidity sensitive material. 4,373,391, Cl. 73-335.000.
Johnson, Raymond A.: *See*—
Campbell, Stephen W.; Cragg, Eric E.; Elwell, Michael J.; and Johnson, Raymond A., 4,374,188, Cl. 429-187.000.
Johnson, Robert A., to Rockwell International Corporation. Mechanical filter with acoustic sensing. 4,373,396, Cl. 73-651.000.
Johnsson, Bo A.: *See*—
Stenberg, Kaj O.; Traven, Lars J. C.; Losell, Ingvar F.; and Johnsson, Bo A., 4,374,088, Cl. 422-46.000.
Johnston, James J., to Connector Technology Corporation. Electrical connector assembly. 4,373,766, Cl. 339-91.00R.
Jones, Dennis A.; and Boggs, Bruce E., to JTM Industries, Inc. Road base stabilization using lime kiln dust. 4,373,958, Cl. 106-118.000.
Jones, Ira D. Scope for viewing the internal surface of a bore or similar cavity. 4,373,811, Cl. 356-241.000.
Jones, Robert A., to United Technologies Corporation. Thrust reverser. 4,373,328, Cl. 60-226.200.
Jones, Terry V.: *See*—
Bednar, John M.; Postler, Daniel P.; and Jones, Terry V., 4,373,582, Cl. 166-65.00R.
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., to General Electric Company. System for controlling spouted bed inlet conditions. 4,373,272, Cl. 34-57.00A.
Jones, Thomas E.: *See*—
McCartney, Joseph F.; Jones, Thomas E.; and Johnson, Leopold J., 4,374,186, Cl. 429-154.000.
Jones, Thomas F., to Tobacco Machinery Co. of Ky. Inc. Tobacco leaf stripper. 4,373,323, Cl. 56-27.500.
Joseph, Horst G.: *See*—
Flockenhaus, Claus; Galow, Manfred; Meckel, Joachim F.; and Joseph, Horst G., 4,373,997, Cl. 202-230.000.
JTM Industries, Inc.: *See*—
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Jung, Michel: *See*—
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Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
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Kabushiki Kaisha Meidensha: *See*—
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Kabushki Kaisha Suwa Seikosha: *See*—
Mikoshiba, Hitoshi, 4,373,439, Cl. 101-93.090.
Kaiser, William L.; and Brown, Gale R., to Zimmer, Inc. Method of drilling living bone. 4,373,518, Cl. 128-92.0EB.
Kajikawa, Shuji; Kanai, Kazuo; and Ito, Haruo, to Nippon Kokan Kabushiki Kaisha. Apparatus for manufacturing rapidly cooled solidified slag. 4,373,907, Cl. 432-83.000.
Kajimaki, Masao: *See*—
Bandai, Shinji; Kajimaki, Masao; Nakajima, Yoshihiro; Yagi, Akira; and Nishimura, Haruo, 4,373,224, Cl. 15-1.50A.
Kakizaki, Katsumi; and Kozuka, Michihiro, to Tomy Kogyo Co., Inc. Toy racing game. 4,373,293, Cl. 46-206.000.
Kamahara, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Light triggered thyristor device. 4,374,393, Cl. 357-30.000.
Kamei, Shigeki; Fushio, Masamori; and Hirai, Atuo, to Hitachi Kiden Kogyo, Ltd. Method and apparatus for dewatering screenings. 4,373,433, Cl. 100-37.000.
Kamiyama, Shin-ichi; Ohshima, Kiyoshi; Mochizuki, Manabu; Kato, Kazuyuki; and Saito, Takeshi, to Ricoh Company, Ltd. Wet type electrophotographic copying machine. 4,373,800, Cl. 355-10.000.
Kanai, Kazuo: *See*—
Kajikawa, Shuji; Kanai, Kazuo; and Ito, Haruo, 4,373,907, Cl. 432-83.000.
Kanakaris, Georges, to Santrade Ltd. Expansible mandrel. 4,373,411, Cl. 82-44.000.
Kanbe, Junichiro: *See*—
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Kane, James: *See*—
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Kanebo, Ltd.: *See*—
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Kanebo Synthetic Fibers Ltd.: *See*—
Aoki, Kiyoshi; and Ohara, Saburo, 4,374,176, Cl. 428-392.000.
Kanesaka, Michiru: *See*—
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Kao Corporation: *See*—
Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, 4,374,052, Cl. 252-522.00R.
Kao, James T. F.; and Jensen, Wayne D., to Ethyl Corporation. Process for producing substituted pyrroles. 4,374,254, Cl. 548-527.000.
Kao, James T. F.; and Farritor, Robert E., to Ethyl Corporation. Process for producing substituted pyrroles. 4,374,255, Cl. 548-531.000.
Kao, James T. F.; and Wiegand, Karl E., to Ethyl Corporation. Process for the preparation of pyrryl-2-acetonitrile. 4,374,256, Cl. 548-561.000.
Kao Soap Co., Ltd.: *See*—
Watanabe, Hiroshi; and Hirota, Hajime, 4,374,056, Cl. 252-546.000.
Kaplan, Robert A.; Reicke, Mark A.; and Wellman, James E., to Scott & Fetzer Company, The. Adjustable flame spreader for gun-type power gas burner. 4,373,901, Cl. 431-186.000.
Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, 4,373,230, Cl. 16-288.000.
Karneev, Vladimir M.: *See*—
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Kasper, Thomas J.: *See*—
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Katayama, Aisuke. Divisor transform type high-speed electronic division system. 4,374,427, Cl. 364-761.000.
Kato Hatsujo Kaisha, Ltd.: *See*—
Inamoto, Hiroshi; Sobajima, Katsunobu; and Miyoshi, Shoichi, 4,373,826, Cl. 403-14.000.
Kato, Hirokazu: *See*—
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Kato, Kazuyuki: *See*—
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Kato, Shinichi; Tsuda, Hiroshi; Yamaki, Kiyoshi; Suzuki, Tadashi; and Kuwano, Fumiyoshi, to Nissan Motor Company, Limited. Switch arrangement on motor vehicle steering wheels. 4,374,310, Cl. 200-61.540.
Kaufman, Glenn A.: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., 4,373,384, Cl. 73-119.00A.
Kaufman, Sydney M., to Ford Motor Company. Method for beneficiating ductile scrap metal. 4,373,675, Cl. 241-23.000.
Kaufmann, Richard O., to Thermal Engineering of Arizona, Inc. Commercial laundry heat recovery system. 4,373,572, Cl. 165-1.000.
Kawakubo, Takamasa; and Hirasawa, Kiyosi, to Mitsubishi Pencil Co., Ltd. Method of fabricating an eraser. 4,374,225, Cl. 524-302.000.
Kawamoto, Hiromi: *See*—
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Kawano, Yoshihiko; Adachi, Hirosi; Watanuki, Masakazu; and Ueno, Takashi, to Kobukura Iron Works Co., Ltd. Impact type crusher. 4,373,679, Cl. 241-275.000.
Kawasaki, Hiroshi: *See*—
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Kawasaki Steel Corporation: *See*—
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Kazami, Kazuyuki: *See*—
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Keil, O'Dell M.: *See*—
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Keller, Hans W. Piezoresistive pressure cell. 4,373,397, Cl. 73-721.000.
Keller, Herbert. Peak load device of a multistage turbine. 4,373,340, Cl. 60-677.000.
Kelly, John, Jr.: *See*—
Dellinger, Thomas B.; and Kelly, John, Jr., 4,373,592, Cl. 175-61.000.
Kemmner, Ulrich; Ringwald, Peter; Mutschele, Hans-Ulrich; and Schillinger, Rainer, to Robert Bosch GmbH. Noise damping device. 4,373,872, Cl. 417-312.000.
Kendall Company, The: *See*—
Wichman, Cynthia A., 4,373,214, Cl. 2-51.000.
Kennedy, John M.; and Kennedy, William R. Door for a mine stopping having knife-edge hinges. 4,373,294, Cl. 49-388.000.
Kennedy Van Saun Corporation: *See*—
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Kennedy, William R.: *See*—
Kennedy, John M.; and Kennedy, William R., 4,373,294, Cl. 49-388.000.
Kenner, Bernard A.; and Conaway, John R., to Electronic Memories and Magnetics Corporation. Read systems for 2½D coincident current magnetic core memory. 4,374,432, Cl. 365-209.000.
Kenney, Martin J.: *See*—
Schritt, Renaldo F.; and Kenney, Martin J., 4,373,619, Cl. 192-0.090.
Kenyon, Alan. Sawing of lumber from logs. 4,373,563, Cl. 144-357.000.
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Kerfeld, Donald J., to Minnesota Mining and Manufacturing Company. Process for making information carrying discs. 4,374,077, Cl. 264-22.000.
Kerr-McGee Corporation: *See*—
Brule, Michael R., 4,374,015, Cl. 208-8.0LE.
Kewanee Industries, Inc.: *See*—
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Khadder, Wadie N.; Wang, Jia-Tarng; and Solomon, James E., to National Semiconductor Corporation. Integrated CMOS process with JFET. 4,373,253, Cl. 29-576.00B.
Khasikov, Viktor V.: *See*—
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Kido, Takayoshi: *See*—
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Kiess, Jurgen: *See*—
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Kikuchi, Masatsugu: *See*—
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Kikuchi, Yasuo: *See*—
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Kilcy, James J. Method and apparatus for producing 360 degree radiation with static components. 4,374,365, Cl. 372-92.000.
Kilejian, Lisa Ann: *See*—
Kilejian, Vahe, 4,373,530, Cl. 128-334.00R.
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Kilian, Alois, to Dravo Corporation. Process of heat-treating pellets. 4,373,946, Cl. 75-5.000.
Kilner, David N., to Priamo Universal Limited. Apparatus for applying road marking materials to roadways. 4,373,670, Cl. 239-172.000.
Kilwin, Thomas C., to UMC Industries Inc. Torque limiting overload coupling. 4,373,923, Cl. 464-36.000.
Kim, Chang-Kyu; and Maggiulli, Cataldo A., to Eastman Kodak Company. Method for preparing 1-aryl-3-arylamino-2-pyrazolin-5-ones from N-aryl-3-arylamino-3-oximinopropionamides. 4,374,253, Cl. 548-360.000.
Kim, Kwon S., to Star Manufacturing Co. Prefabricated panel construction system. 4,373,312, Cl. 52-309.900.
Kim, Oh-Kil; and Fox, Robert B., to United States of America, Navy. Electrically conductive polymeric compositions. 4,374,048, Cl. 252-500.000.
Kim, Sang N.; McMahon, Paul E.; Riggs, John P.; and Rhodes, John M., to Celanese Corporation. Process for the surface modification of carbon fibers. 4,374,114, Cl. 423-447.100.
Kim, Sang U., to International Business Machines Corporation. Forming Schottky barrier diodes by depositing aluminum silicon and copper or binary alloys thereof and alloy-sintering. 4,373,966, Cl. 148-1.500.
Kim, Tai K.; MacInnis, Martin B.; McClintic, Robert P.; and Vogt, Martin C., to GTE Products Corporation. Recovery of tungsten values from alkali tungstate solutions by solvent extraction. 4,374,099, Cl. 423-54.000.
Kimata, Kei; and Nakazeki, Tsugito, to NTN Toyo Bearing Company, Limited. Fuel injection apparatus. 4,373,490, Cl. 123-452.000.
Kimberly-Clark Corporation: *See*—
Lilaonitkul, Amnuey; and Tews, Richard R., 4,373,529, Cl. 128-285.000.
Kimoto & Co., Ltd.: *See*—
Moriya, Takeo; and Yamagata, Toshio, 4,374,193, Cl. 430-149.000.
Kimura, Hiroyuki; and Yamada, Tateo, to Canon Kabushiki Kaisha. Film rewinding device for camera. 4,373,795, Cl. 354-173.000.
Kimzey, Paul W.; and Frederick, Sherman B., to Tennant Company. Surface maintenance equipment. 4,373,227, Cl. 15-347.000.
Kincaid, John, to Belden Corporation. Triboelectric transducer cable. 4,374,299, Cl. 174-36.000.
Kipp, Robert M.: *See*—
Ayers, Ray R.; and Kipp, Robert M., 4,373,753, Cl. 285-319.000.
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Kirk, J. David, to Outboard Marine Corporation. Internal combustion engine. 4,373,475, Cl. 123-59.00B.
Kirwan, Patrick N.: *See*—
Dorosz, Adolph S.; Kirwan, Patrick N.; and Szydlek, Nicholas P., 4,373,458, Cl. 112-121.120.
Kishi, Mitsuhiro. Lifting apparatus. 4,373,701, Cl. 254-122.000.
Kishida, Nobuhiro; Shishido, Kunihiro; and Haryu, Satoshi, to Toyo Seikan Kaisha, Ltd. Apparatus for cooling a transfer mandrel. 4,373,891, Cl. 425-174.400.
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Fujishiro, Takeshi; Takeuchi, Kiyoshi; and Kita, Toru, 4,373,378, Cl. 73-35.000.
Kitagawa, Junji: *See*—
Kitamura, Sotoo; Akita, Sigeyuki; and Kitagawa, Junji, 4,373,388, Cl. 73-301.000.
Kitamura, Shigeki: *See*—
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Kite, Kenneth M.; Eberts, Allen F.; and Cocovich, Joseph A., to CPG Products Corp. Electronic vehicle race simulator. 4,373,722, Cl. 273-85.00G.
Kitou, Nobuo: *See*—
Yuge, Shizuo; Kitou, Nobuo; Yamamoto, Toshio; and Kanesaka, Michiru, 4,373,802, Cl. 355-14.0FU.
Kitsch, Edward A.: *See*—
Krause, James A.; and Kitsch, Edward A., 4,373,937, Cl. 55-118.000.
Kiwala, Jacob: *See*—
Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,374,055, Cl. 252-522.00R.
Klaus, Gerald R.; and Williams, Thomas E., to Fellowes Manufacturing. Literature shelving. 4,373,449, Cl. 108-60.000.
Klawitter, Jerome J., to Hemex, Inc. Heart valves having edge-guided occluders. 4,373,216, Cl. 3-1.500.
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Kleiman, Alexandr M.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.
Kleimenov, Nikolai A.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.
Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,374,245, Cl. 546-20.000.
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,374,137, Cl. 424-258.000.
Klem, John E., to International Harvester Co. Axle bolster pivot assembly. 4,373,739, Cl. 280-111.000.
Klemarczyk, Philip T.; Belko, Robert P.; and Boden, Richard M., to International Flavors & Fragrances Inc. Unsaturated aldehydes, organoleptic uses thereof and process for preparing same. 4,374,053, Cl. 252-522.00R.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Use in perfumery of carboalkoxy alkyl norbornanes. 4,374,054, Cl. 252-522.00R.
Kline, Christopher R.: *See*—
Haagen, Peter H.; and Kline, Christopher R., 4,374,307, Cl. 179-84.00T.
Kling, Lothar. Device for injection syringe. 4,373,526, Cl. 128-215.000.
Klosek, John M.; and Wu, Margaret M., to Mobil Oil Corporation. Selective oxidation of ethyl toluene or methyl styrene isomer mixtures to enrich meta-isomer content. 4,374,297, Cl. 585-868.000.
Kluger, Edward W.; and Rolen, Jack L., to Milliken Research Corporation. Process for hydroxyalkylation of cyanoethylanilines. 4,374,068, Cl. 260-465.00D.
Knapp, Heinrich, to Robert Bosch GmbH. Fuel supply system. 4,373,491, Cl. 123-472.000.
Knappe, Herman E., to Cherry-Burrell Corporation. Double block and vent valve. 4,373,545, Cl. 137-240.000.

Knifton, John F.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,374,285, Cl. 568-902.000.
Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., to Steelcase Inc. Chair control with height adjustment actuator. 4,373,692, Cl. 248-162.100.
Kobayashi, Hisamine, to Kabushiki Kaisha Shikishima Tipton. Deburring apparatus for workpieces. 4,373,296, Cl. 51-3.000.
Kobayashi, Shigeki: *See*—
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,374,074, Cl. 264-8.000.
Kobayashi, Susumu, to Terumo Corporation. Method and apparatus for detecting occlusion in fluid-infusion tube of peristaltic type fluid-infusion pump. 4,373,525, Cl. 128-214.00E.
Kobayashi, Takanobu, to Hitachi Shipbuilding & Engineering Company Limited. Plug driving apparatus. 4,373,316, Cl. 53-67.000.
Koberstein, Edgar: *See*—
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Kobler, Ingo, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Doctor blade construction for printing machine. 4,373,445, Cl. 101-365.000.
Kobukura Iron Works Co., Ltd.: *See*—
Kawano, Yoshihiko; Adachi, Hirosi; Watanuki, Masakazu; and Ueno, Takashi, 4,373,679, Cl. 241-275.000.
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, to Ciba-Geigy Corporation. Cephalosporin compounds with terminal aminocarboxylic acid groupings and anti-bacterial use thereof. 4,374,134, Cl. 424-246.000.
Koehler, Raymond A.: *See*—
Gryskiewicz, Gregory A.; and Koehler, Raymond A., 4,374,169, Cl. 428-221.000.
Kofahl, William M. Hydrostatic and oil well pump. 4,373,873, Cl. 417-339.000.
Kohsaka, Yohji: *See*—
Ouchi, Chiaki; and Kohsaka, Yohji, 4,373,951, Cl. 75-123.00N.
Kohzai, Yoshinori; Oyama, Shigeaki; and Koyama, Tatsuo, to Fujitsu Fanuc Limited. Direct current motor having E-shaped interpoles. 4,374,337, Cl. 310-186.000.
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, to Fujitsu Fanuc Limited. Control system for stopping spindle at predetermined rotational position. 4,374,350, Cl. 318-590.000.
Kolb, Michael: *See*—
Bey, Philippe; Jung, Michel; Kolb, Michael; and Danzin, Charles, 4,374,128, Cl. 424-180.000.
Koltz, Irving M. Multi panel visual device. 4,373,730, Cl. 273-155.000.
Kommineni, Prasad R., to Westinghouse Electric Corp. Semi-flexible gas-insulated transmission line using sandwiched discs for intermittent flexing joints. 4,374,298, Cl. 174-21.00C.
Komori, Kazuhiro: *See*—
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Komurasaki, Satoshi; and Yamane, Tsuneo. Ignition timing correcting system for internal combustion engine. 4,373,487, Cl. 123-418.000.
Kondo, Nobuaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,373,415, Cl. 84-1.010.
Kondo, Toshio, to Aisin Seiki Kabushiki Kaisha. Disc brakes. 4,373,616, Cl. 188-73.450.
Konishiroku Photo Industry Co., Ltd.: *See*—
Yoshizaki, Osamu; and Inai, Masayuki, 4,374,385, Cl. 346-1.100.
Konrath, Karl; and Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump for internal combustion engine. 4,373,492, Cl. 123-502.000.
Koppers Company, Inc.: *See*—
Becker, Andrew R., 4,373,936, Cl. 55-97.000.
Hetrick, Earl C.; and Winter, Donald T., 4,373,998, Cl. 202-258.000.
Koral, Marvin: *See*—
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,374,057, Cl. 252-426.000.
Korgaonkar, Jaising. Pipe clamp. 4,373,235, Cl. 24-285.000.
Korzenietz, Willi. Apparatus for random number selection. 4,373,728, Cl. 273-144.00B.
Kosa, Yasunobu; and Komori, Kazuhiro, to Hitachi, Ltd. Method of manufacturing a semiconductor integrated circuit device. 4,373,249, Cl. 29-571.000.
Kostler, Hans-Gunter: *See*—
Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, 4,374,145, Cl. 424-278.000.
Kostuch, Donald J.: *See*—
Bradley, David J.; Gibbs, Dennis D.; Kostuch, Donald J.; and Martin, James S., 4,374,417, Cl. 364-200.000.
Koutsky, Ronald A.: *See*—
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Kovach, Stephen M.: *See*—
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Koyama, Hideo: *See*—
Yoshioka, Nobuyuki; Suzuki, Tsutai; Haba, Masanori; and Koyama, Hideo, 4,374,160, Cl. 427-101.000.
Koyama, Tatsuo: *See*—
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Koziol, Walter, to Modern Home Products Corp. Adjustable venturi tube assembly for a gas barbecue grill. 4,373,505, Cl. 126-39.00E.
Kozlowski, John J., Jr.: *See*—
Nichols, Gary R.; and Kozlowski, John J., Jr., 4,373,486, Cl. 123-414.000.
Kozlowski, Thomas A.: *See*—
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Kozuka, Hirotsugu: *See*—
Nanba, Mitsuo; Ogirima, Masahiko; Kozuka, Hirotsugu; and Shintani, Akira, 4,373,975, Cl. 148-189.000.
Kozuka, Michihiro: *See*—
Kakizaki, Katsumi; and Kozuka, Michihiro, 4,373,293, Cl. 46-206.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Deinlein, Hans; and Kummer, Gottfried, 4,374,083, Cl. 376-306.000.
Krakovsky, Rafael. Long life valve. 4,373,546, Cl. 137-330.000.
Krause, James A.; and Kitsch, Edward A., to Emerson Electric Co. Electrostatic precipitator with modular cabinet and cell washer. 4,373,937, Cl. 55-118.000.
Krautkramer-Branson Incorporated: *See*—
Renzel, Peter; and Vermohlen, Werner, 4,373,394, Cl. 73-606.000.
Kreager, William D.; and Mason, Stanley I., Jr., to Frito-Lay, Inc. Ultrasonic sealing apparatus. 4,373,982, Cl. 156-359.000.
Kreis, Philipp, to GmbH & Co. TRUMA-Geratebau. Water heater. 4,373,472, Cl. 122-14.000.
Krieger, Klaus: *See*—
Greiner, Max; Krieger, Klaus; Schiller, Gottfried; Walk, Wolf-Rudiger; and Walz, Ludwig, 4,373,496, Cl. 123-569.000.
Krone GmbH: *See*—
Lohr, Joachim, 4,374,306, Cl. 179-81.00R.
Kruger, Hermann; and Willmann, Michael, to Volkswagenwerk Aktiengesellschaft. Device for controllable coupling of two shaft parts with a predetermined angle of rotation correlation. 4,373,481, Cl. 123-198.00F.
KTS, Kunstoff-Technische Spezialfertigungen Anni Przytarski: *See*—
Przytarski, Joachim, 4,373,643, Cl. 220-450.000.
Kubota, Ltd.: *See*—
Itatani, Hiroshi; Tone, Masatsugu; and Kurohara, Kazuaki, 4,373,597, Cl. 180-70.0MS.
Kuboto, Masaaki: *See*—
Sakamoto, Yukio; Tanaka, Tetsuo; Kuboto, Masaaki; and Sugitani, Masami, 4,374,369, Cl. 333-182.000.
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, to Unitika Limited. Method for manufacturing polyester fibers with good adhesion to rubber. 4,374,031, Cl. 252-8.800.
Kuge, Tsukasa; Matsumoto, Toru; Watanabe, Tsuyoshi; and Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Apparatus for developing electrostatic latent images. 4,373,469, Cl. 118-652.000.
Kuhara, Tetsuji: *See*—
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Kuipers, Johannes: *See*—
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Kulkarni, Ravindra D.; and Goodard, Errol D., to Union Carbide Corporation. Silanated calcium carbonate fillers. 4,374,178, Cl. 428-404.000.
Kullack, Manfred: *See*—
Schepers, Bernhard; Nobbe, Volker; Schroder, Bernd; Borer, Werner; and Kullack, Manfred, 4,374,119, Cl. 423-625.000.
Kulp, Leon; and Noggle, Donald E. Manhole leakage indicator and method for using. 4,373,381, Cl. 73-40.50R.
Kumagai, Akira: *See*—
Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, 4,374,284, Cl. 568-817.000.
Kummer, Gottfried: *See*—
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Kundler, Walter; Pientak, Reinhold; Schulz, Claus; and Skerka, Wolfgang, to Anschutz & Co. GmbH. Arrangement for monitoring a rudder control system. 4,374,423, Cl. 364-434.000.
Kunihiro, Yukitoshi, to Matsushita Electric Industrial Co., Ltd. Safety device for electric motor driven kitchen utensils. 4,373,677, Cl. 241-37.500.
Kunz, Peter. Weighing apparatus with electromagnetic force compensation. 4,373,596, Cl. 177-212.000.
Kuribayashi, Yasushi, to Nissan Motor Co., Ltd. Supercharge system of an internal combustion engine. 4,373,335, Cl. 60-602.000.
Kurohara, Kazuaki: *See*—
Itatani, Hiroshi; Tone, Masatsugu; and Kurohara, Kazuaki, 4,373,597, Cl. 180-70.0MS.
Kuroiwa, Hiroshi: *See*—
Nishimura, Yutaka; Kuroiwa, Hiroshi; Kirisawa, Tadashi; and Oyama, Yoshishige, 4,373,387, Cl. 73-204.000.
Kurosaki, Yasuhide: *See*—
Tsukada, Shusei; and Kurosaki, Yasuhide, 4,373,798, Cl. 355-3.0DD.
Kurz, Manfred, to Behr-Thomson Dehnstoffregler GmbH. Multiple contacts, snap-action, thermal switch. 4,374,373, Cl. 337-383.000.
Kuwano, Fumiyoshi: *See*—
Kato, Shinichi; Tsuda, Hiroshi; Yamaki, Kiyoshi; Suzuki, Tadashi; and Kuwano, Fumiyoshi, 4,374,310, Cl. 200-61.540.
Kyker, Robert A., to Brunswick Corporation. Snap-in self-centering mechanism button. 4,373,683, Cl. 242-84.21R.
Kyoto Ceramic Co., Ltd.: *See*—
Inamori, Kazuo; and Miyawaki, Kiyoshige, 4,374,316, Cl. 219-209.000.
Labiol S.A.: *See*—
Brun, Nicole A. A., 4,373,382, Cl. 73-53.000.

Labus, Thomas J.: *See*—
Massey, Lester G.; Brabets, Robert I.; Abel, William A.; Anderson, James K.; Labus, Thomas J.; and George, Davis A., 4,373,864, Cl. 417-46.000.
Lach, Lawrence E.: *See*—
Tekippe, Vincent J.; and Lach, Lawrence E., 4,374,328, Cl. 250-458.100.
Lach, Richard F.; and Calcasola, Richard W., to United Technologies Corporation. Passenger entertainment system transducer failure detector. 4,374,435, Cl. 370-13.000.
Lacombat, Michel; Pircher, Georges; and LeFevre, Herve, to Thomson-CSF. Compact optical coupling device and optical-fiber interferometer gyrometer comprising such a device. 4,373,814, Cl. 356-350.000.
Lacombat, Michel: *See*—
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, 4,373,774, Cl. 350-6.600.
Ladusaw, William T., to General Electric Company. Variable displacement compressor. 4,373,352, Cl. 62-196.00C.
Ladusaw, William T., to General Electric Company. Discharge valve assembly for compressor. 4,373,882, Cl. 418-270.000.
La Fever, Clifford E.: *See*—
Washburn, William J.; Thompson, Hugh B.; and La Fever, Clifford E., 4,373,422, Cl. 89-33.0CA.
Lagelbauer, Ernest. Centrifuge separator. 4,373,941, Cl. 55-401.000.
Lago, Rudolph M.: *See*—
Haag, Werner O.; and Lago, Rudolph M., 4,374,296, Cl. 585-739.000.
Laib, Donald L., to Morvue, Inc. Scanning beam optical position determining apparatus and method. 4,373,816, Cl. 356-375.000.
L'Air Liquide: *See*—
Barbier, Jean-Paul; and Lerouyer, Gilbert, 4,374,157, Cl. 427-37.000.
Lakatos, Eduard: *See*—
Bozon, Alfred; Lakatos, Eduard; Koberstein, Edgar; Pletka, Hans-Dieter; and Volker, Herbert, 4,374,047, Cl. 252-472.000.
Lama, William L., to Xerox Corporation. Image transmitting system utilizing a gradient index lens. 4,373,780, Cl. 350-96.250.
Lambert, Lloyd J., Jr. Wrist curl machine. 4,373,717, Cl. 272-67.000.
Lancellotti, Enrico, to Sunfilter S.r.l. Reducible volume sun-blind. 4,373,568, Cl. 160-184.000.
Landfors, Arthur A., to Varian Associates, Inc. Diffusion pump for leak detector. 4,373,868, Cl. 417-154.000.
Landriault, Leonard S.: *See*—
Bollfraas, Charles A.; Landriault, Leonard S.; and McDonald, Patrick E., 4,373,754, Cl. 285-334.000.
Lang, Franklin D., to Nitney Corporation. Padding press. 4,373,843, Cl. 412-10.000.
Lange, Dennis M. Steerable auxiliary wheel assembly for vehicles. 4,373,738, Cl. 280-81.500.
Langley, Jeffrey T., to Fiber Industries, Inc. Wholly aromatic polyester capable of forming an anisotropic melt phase consisting essentially of para-oxybenzoyl moiety, bromo-substituted-para-oxybenzoyl moiety, and meta-oxybenzoyl moiety. 4,374,228, Cl. 524-599.000.
Larkins, Thomas H.; Polichnowski, Stanley W.; Tustin, Gerald C.; and Young, David A., to Eastman Kodak Company. Preparation of acetic anhydride. 4,374,070, Cl. 260-549.000.
Larkins, Thomas H., Jr., to Eastman Kodak Company. Preparation of ethylidene diacetate. 4,374,265, Cl. 560-263.000.
Larson, Vivian M.; and Lehman, E. Dale, to Merck & Co., Inc. Herpes sub unit vaccine. 4,374,127, Cl. 424-89.000.
Latham, David J.: *See*—
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Lau, Kreisler S. Y., to Hughes Aircraft Company. Synthesis of bis(ethynylphenyl) compounds. 4,374,291, Cl. 585-320.000.
Laufer, Helmut: *See*—
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Lautenschlager, Karl, to Karl Lautenschlager KG, Mobelbeschlagfabrik. Four-joint hinge. 4,373,230, Cl. 16-288.000.
Lauwerijssen, Petrus C.: *See*—
Bouwknegt, Albert; and Lauwerijssen, Petrus C., 4,374,340, Cl. 313-220.000.
LeBlanc, John R.: *See*—
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Lebouc, Bernard, to Framatome. Tool carrier unit movable over a tube-plate. 4,373,855, Cl. 414-744.00R.
Lebreton, Yves: *See*—
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Lee, Carol S., to Mobil Oil Corporation. Catalytic conversion of methanol to light olefins. 4,374,295, Cl. 585-640.000.
Lee, Chang-Kuei, to Occidental Research Corporation. Pyrolysis process and apparatus. 4,373,994, Cl. 201-22.000.
Lee, George E.: *See*—
Lee, Thomas B. K.; and Lee, George E., 4,374,067, Cl. 260-456.00A.
Lee, Julia L.: *See*—
Crivello, James V.; and Lee, Julia L., 4,374,066, Cl. 260-440.000.
Lee, Robert D., to United States of America, National Aeronautics and Space Administration. Scanning seismic intrusion detection method and apparatus. 4,374,378, Cl. 340-566.000.
Lee, Robert D.: *See*—
Olesin, Andrew; Luke, Kevin K. L.; and Lee, Robert D., 4,374,357, Cl. 323-351.000.
Lee, Thomas B. K.; and Lee, George E., to Hoechst-Roussel Pharmaceuticals, Inc. Intermediates for the preparation of 4-phenyl-1,3-benzodiazepins and methods for preparing the intermediates. 4,374,067, Cl. 260-456.00A.
Lee, Tien P., to Bell Telephone Laboratories, Incorporated. Dual-wavelength light-emitting diode. 4,374,390, Cl. 357-17.000.
Leeds & Northrup Company: *See*—
Fishman, Walter; and Jenkins, Theron W., Jr., 4,374,351, Cl. 318-600.000.
LeFevre, Cecil W.: *See*—
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,374,271, Cl. 564-310.000.
LeFevre, Herve: *See*—
Lacombat, Michel; Pircher, Georges; and LeFevre, Herve, 4,373,814, Cl. 356-350.000.
Lefrancois, Philip A., to Allied Corporation. Production of silane. 4,374,111, Cl. 423-347.000.
Leger, Robert: *See*—
Maldonado, Paul; Nouguier, Robert; Fayard, Jean-Claude; and Leger, Robert, 4,374,282, Cl. 568-672.000.
Legg, Douglas J.; and Burke, Ben G., to Chevron Research Company. Method and apparatus for restraining radial flow catalytic reactor centerpipes. 4,374,095, Cl. 422-218.000.
Lehman, E. Dale: *See*—
Larson, Vivian M.; and Lehman, E. Dale, 4,374,127, Cl. 424-89.000.
Leiber, Heinz, to Robert Bosch GmbH. Anti skid control system. 4,374,421, Cl. 364-426.000.
Leiberich, Hermann, to Sybron Corporation. Fluid flow control valve for dental instruments. 4,373,699, Cl. 251-139.000.
Leibinsohn, Saul. Liquid flow control devices particularly useful in infusion administration sets. 4,373,524, Cl. 128-214.00R.
Leigh Flexible Structures Limited: *See*—
Fish, Daniel C. E., 4,373,462, Cl. 114-74.00R.
Lenhard, Myron J.: *See*—
Snelling, Christopher; and Lenhard, Myron J., 4,373,799, Cl. 355-3.00R.
Leningradsky Ordena Trudovogo Krasnogo Znameni Institut Textilnoi I Legkoi Promyshlennosti Imeni S.M. Kirova: *See*—
Alexandrov, Sasho P.; Mubarakshin, Gadylsha M.; Volf, Leonard A.; and Burinsky, Stanislav V., 4,374,204, Cl. 521-28.000.
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Barbier, Jean-Paul; and Lerouyer, Gilbert, 4,374,157, Cl. 427-37.000.
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Gribnau, Thomas C. J.; Roeles, Frits; and Leuvering, Johannes H. W., 4,373,932, Cl. 436-501.000.
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Cole, Bruce A.; Levine, Harold I.; McGuire, Michael T.; Nelson, Kathleen J.; and Slade, Louise, 4,374,154, Cl. 426-565.000.
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Spruell, Jerry V.; and Lewis, Jennings B., III, 4,373,949, Cl. 75-60.000.
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Hutchinson, George M.; and Burchette, Robert L., Jr., 4,373,685, Cl. 242-118.600.
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Martellock, Arthur C.; Carlston, Richard L.; and Liang, Shwu-Jian, 4,374,212, Cl. 523-212.000.
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Van Raamsdonk, Cornelis; and Wartusch, Johann, 4,374,223, Cl. 524-245.000.
Light, Kenneth K.: *See*—
Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,374,055, Cl. 252-522.00R.
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Limbocker, Craig F. Air-filter vacuum sweep apparatus. 4,373,939, Cl. 55-287.000.
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Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Synthesis of ethanol by homologation of methanol. 4,374,285, Cl. 568-902.000.
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Toda, Haruhiko; Higo, Moriaki; Saga, Hitoshi; and Shinbo, Masafu, 4,374,292, Cl. 585-360.000.
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Pryor, Timothy R.; Hockley, Bernard; Liptay-Wagner, Nick; Hageniers, Omer L.; and Pastorius, W. J., 4,373,804, Cl. 356-1.000.
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Doliber, Darrel L.; and Keil, O'Dell M., 4,373,269, Cl. 33-246.000.
Dorsey, Glenn F., 4,373,779, Cl. 350-96.210.

Liu, You C., to Ford Motor Company. Method of reducing springback in mechanically pressed sheet materials-I. 4,373,371, Cl. 72-379.000.
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Bauser, Elisabeth; Frik, Martina; Lochner, Karl S.; and Schmidt, Laurenz, 4,373,988, Cl. 156-622.000.
Loebach, Michael H., to Motter Printing Press Co. Diverter mechanism. 4,373,713, Cl. 271-303.000.
Loepfe Brothers Limited: *See*—
Stutz, Hansruedi, 4,373,266, Cl. 33-129.000.
Lohr, Joachim, to Krone GmbH. Zero-loss automatic polarization protection device. 4,374,306, Cl. 179-81.00R.
Lois, Lambros. Device for collecting, transmitting and using solar energy. 4,373,514, Cl. 126-438.000.
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Long, Alden O., Jr., to AMP Incorporated. Method and apparatus for manufacturing electrical harnesses. 4,373,261, Cl. 29-861.000.
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Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,374,413, Cl. 364-200.000.
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,374,414, Cl. 364-200.000.
Lord Corporation: *See*—
Tay, Kay-Kiong, 4,374,218, Cl. 524-86.000.
Lorenzen, John H.; and Majewski, John V., to RTE Corporation. Bayonet-type circuit breaker having a multiple finger integrated contact band. 4,373,772, Cl. 339-130.00R.
Lorenzoni, Loreno: *See*—
Messina, Giuseppe; Moretti, Mario D.; and Lorenzoni, Loreno, 4,374,279, Cl. 568-558.000.
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Losell, Ingvar F.: *See*—
Stenberg, Kaj O.; Traven, Lars J. C.; Losell, Ingvar F.; and Johnsson, Bo A., 4,374,088, Cl. 422-46.000.
Loter, Ira, to Mallinckrodt International Corp. Process for preparing acid cheese curd. 4,374,152, Cl. 426-39.000.
Loucks, George R.; and Campbell, John R., to General Electric Company. Block copolymers of polyphenylene oxides and non-sterically-hindered high molecular weight aromatic polycarbonates. 4,374,233, Cl. 525-394.000.
Louzon, Theodore J.: *See*—
Geyling, Franz T.; and Louzon, Theodore J., 4,374,161, Cl. 427-160.000.
Lovie, James V.: *See*—
Iwao, Kumiy R.; and Lovie, James V., 4,374,089, Cl. 422-70.000.
Lubnitz, Klaus. Cleaning device for a hung fabric. 4,373,226, Cl. 15-302.000.
Lubrizol Corporation, The: *See*—
Coleman, Lester E., 4,374,034, Cl. 252-51.50A.
Lucas, Bernard H.: *See*—
Skeaff, James M.; Ritcey, Gordon M.; Haque, Kazi E.; and Lucas, Bernard H., 4,374,096, Cl. 423-9.000.
Lucas Industries Limited: *See*—
Campbell, Stephen W.; Cragg, Eric E.; Elwell, Michael J.; and Johnson, Raymond A., 4,374,188, Cl. 429-187.000.
Glaze, Stanley G., 4,373,744, Cl. 280-707.000.
Luccarelli, Domenick, Jr.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Flavoring with 4-methyl-3-cyclohexene-1-carboxylic acid. 4,374,123, Cl. 424-49.000.
Luk, Kong; and Rogers, Norman H., to Beecham Group Limited. 13-Oxo-monic acid esters useful as antibacterial and antimycoplasmal agents. 4,374,147, Cl. 424-283.000.
Luke, Kevin K. L.: *See*—
Olesin, Andrew; Luke, Kevin K. L.; and Lee, Robert D., 4,374,357, Cl. 323-351.000.
Lukens, Inc.: *See*—
Roper, Charles R., Jr.; Strattan, John K.; Hetherington, Roy, Jr.; and Hiller, Austin J., 4,373,967, Cl. 148-2.000.
Lundquist, Burton R.; and Kozlowski, Thomas A., to Armour and Company. Carton with inspection flap and easy opening features and blanks therefor. 4,373,661, Cl. 229-87.00F.
Lunn, Royston C.; MacAfee, J. Edwin; Grabowski, Robert C.; Renneker, Dennis N.; and Winkler, John M., to American Motors Corporation. Transfer case. 4,373,604, Cl. 180-247.000.
Lussiez, Guy W.; and Jha, Mahesh C., to Amax Inc. Chemical dissolution of scale formed during pressure leaching of nickeliferous oxide and silicate ores. 4,374,101, Cl. 423-150.000.
Lutz, Gerhard, to Gelu Reutlinger Steinwerk Gerhard Lutz GmbH. Supporting bolt. 4,373,309, Cl. 52-182.000.
Lutz, Milton F., Sr. Stackable can. 4,373,633, Cl. 206-508.000.
Lux, Peter W., to U.S. Philips Corporation. Device for determining a radiation attenuation distribution in a plane of a body. 4,374,419, Cl. 364-414.000.
Lyapunov, Andrei Y.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.
Lycan, Goodwin A. Gauge calibration block. 4,373,267, Cl. 33-168.00R.
Lydiard, Graeme K., to Lydiard Shoe Co. Ltd. Footwear. 4,373,275, Cl. 36-129.000.
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Lydiard, Graeme K., 4,373,275, Cl. 36-129.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Kobler, Ingo, 4,373,445, Cl. 101-365.000.
Maag Gear-Wheel & Machine Company Ltd.: *See*—
Spaeth, Hans, 4,373,268, Cl. 33-179.50R.
MacAfee, J. Edwin: *See*—
Lunn, Royston C.; MacAfee, J. Edwin; Grabowski, Robert C.; Renneker, Dennis N.; and Winkler, John M., 4,373,604, Cl. 180-247.000.
MacDonald, Russel J.; and Hodgdon, Russell B., to Ionics Incorporated. Synthesis of base-stable aliphatic anion exchange polymers. 4,374,206, Cl. 521-38.000.
MacEwen, George E., to Phillips Petroleum Company. Cartridge-type dispenser. 4,373,646, Cl. 222-327.000.
Maciejewski, Edward T.: *See*—
Gardner, Kenneth L.; Gootzait, Edward; Maciejewski, Edward T.; and Fisher, Donald L., 4,373,45., Cl. 110-101.0CC.
MacInnis, Martin B.: *See*—
Kim, Tai K.; MacInnis, Martin B.; McClintic, Robert P.; and Vogt, Martin C., 4,374,099, Cl. 423-54.000.
Mackay, Donald A. M.: *See*—
Stroz, John J.; and Mackay, Donald A. M., 4,374,122, Cl. 424-48.000.
Mackison, Robert: *See*—
Hancock, Ronald D.; and Mackison, Robert, 4,374,263, Cl. 560-204.000.
MacPhee, Ralph G. Storeroom bin marker. 4,373,466, Cl. 116-315.000.
MacTaggart, John M.: *See*—
Chen, Shi-Chow; and MacTaggart, John M., 4,374,069, Cl. 260-465.400.
Madwed, Albert. Long term storage and use of solar energy. 4,373,573, Cl. 165-2.000.
Maggiulli, Cataldo A.: *See*—
Kim, Chang-Kyu; and Maggiulli, Cataldo A., 4,374,253, Cl. 548-360.000.
Magnavox Government and Industrial Electronics Company: *See*—
Nichols, Gary R.; and Kozlowski, John J., Jr., 4,373,486, Cl. 123-414.000.
Mahaffy & Harder Engineering Co.: *See*—
Mahaffy, Reid A.; and Anderson, George W., 4,373,341, Cl. 60-721.000.
Mahaffy, Reid A.; and Anderson, George W., to Mahaffy & Harder Engineering Co. Expandible package for dispensing containers. 4,373,341, Cl. 60-721.000.
Majewski, John V.: *See*—
Lorenzen, John H.; and Majewski, John V., 4,373,772, Cl. 339-130.00R.
Maki, Toshimichi: *See*—
Date, Takasaburo; Maki, Toshimichi; Iguchi, Mitsuya; Iwamaru, Sumifusa; and Watanabe, Hisashi, 4,373,911, Cl. 432-152.000.
Maldonado, Paul; Nouguier, Robert; Fayard, Jean-Claude; and Leger, Robert, to Elf France. Ethers of polyols, their preparation and use. 4,374,282, Cl. 568-672.000.
Malec, Robert E., to Edwin Cooper, Inc. Dispersant and lubricating oil containing the dispersant. 4,374,033, Cl. 252-49.600.
Mallinckrodt International Corp.: *See*—
Loter, Ira, 4,374,152, Cl. 426-39.000.
Mallinson, Richard B., to Singer Company, The. Laser altimeter and probe height sensor. 4,373,805, Cl. 356-4.000.
Maloney, Edward P.: *See*—
Cory, Thomas R.; Cory, Lyman R.; and Maloney, Edward P., 4,373,737, Cl. 280-30.000.
Maloof, Ralph P. Method of making propeller blade. 4,373,241, Cl. 29-156.80P.
Malott, Theodore A.; and Frost, Barry L., to Clark Equipment Company. Control for mechanical transmission. 4,373,403, Cl. 74-337.500.
Malwah, Manohar L., to Signetics Corporation. Process for fabricating a high capacity memory cell. 4,373,250, Cl. 29-571.000.
Mano, Tetsuro, to Totai Co., Ltd. Apparatus for cutting connecting portions of a sausage chain. 4,373,231, Cl. 17-1.00F.
Mantelle, Jean; and Trouillet, Georges, to Societe Anonyme dite: Vallourec. Joint for pipe intended for petroleum industry. 4,373,750, Cl. 285-55.000.
Marathon Oil Company: *See*—
Bruce, Charles R., 4,373,815, Cl. 356-358.000.
March, Edward J.; and Newman, Raymond J., to Western Electric Co., Inc. High pressure condensation soldering, fusing or brazing. 4,373,658, Cl. 228-242.000.
Maresca, Louis M.: *See*—
Berger, Mitchell H.; Maresca, Louis M.; and Steiner, Ulrich A., 4,374,239, Cl. 528-176.000.
Markevich, Andrei M.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.

Markowicz, Victor: *See—*
Churchill, Richard W.; Hartman, Don W.; Howard, Richard A.; and Markowicz, Victor, 4,373,726, Cl. 273-138.00A.

Markowitz, Harold T., to Medtronic, Inc. Marker channel telemetry system for a medical device. 4,374,382, Cl. 340-870.010.

Markus, Gerardus A., to Black, Sivalls & Bryson. Fuel reactor. 4,373,899, Cl. 431-158.000.

Marley Company: *See—*
Bell, Samuel W., Jr., 4,374,072, Cl. 261-109.000.

Marquess, Gerald E.; and Nell, David J. System for electrically heating and regenerating spent activated carbon. 4,374,092, Cl. 422-199.000.

Martel, Alain: *See—*
Menard, Marcel; and Martel, Alain, 4,374,065, Cl. 260-245.20R.

Martel, Jacques; Tessier, Jean; and Teche, Andre, to Roussel Uclaf. Novel ethers containing a lactone group and a chiral atom. 4,374,257, Cl. 549-302.000.

Martell, Michael D. Venting, self-stopping, aspirating syringe. 4,373,535, Cl. 128-765.000.

Martellock, Arthur C.; Carlston, Richard L.; and Liang, Shwa-Jian, to Xerox Corporation. Sheet handling device. 4,374,212, Cl. 523-212.000.

Martens, Jurgen: *See—*
Kleemann, Axel; Martens, Jurgen; and Samson, Marc, 4,374,062, Cl. 260-112.50R.

Martin, Hardison G.: *See—*
Ponto, Robert; and Martin, Hardison G., 4,374,300, Cl. 179-1.0AT.

Martin, James S.: *See—*
Bradley, David J.; Gibbs, Dennis D.; Kostuch, Donald J.; and Martin, James S., 4,374,417, Cl. 364-200.000.

Martin Marietta Corporation: *See—*
Rosskopf, Philip A., 4,373,956, Cl. 106-90.000.

Martin, Richard T., to Applied Magnetics Corporation. Mask positioning carriage assembly. 4,373,470, Cl. 118-720.000.

Martin, Robert J.; Alderson, Loren L.; and Carlin, Jerry F., to Cessna Aircraft Company, The. Warm-up valve in a variable displacement system. 4,373,869, Cl. 417-213.000.

Martin, Ronald G.: *See—*
Powers, Joseph; Trocciola, John C.; and Martin, Ronald G., 4,374,185, Cl. 429-36.000.

Martini, Alfred R. G., to Tenneco Inc. Tubular exhaust manifold. 4,373,329, Cl. 60-305.000.

Maruko, Saburo. Apparatus for producing fresh water from sea water. 4,373,996, Cl. 202-173.000.

Marvin Glass & Associates: *See—*
Hanson, Steven P.; and Breslow, Jeffrey D., 4,373,729, Cl. 273-153.00S.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Hirt, Alfred, 4,373,512, Cl. 126-418.000.

Masheff, Michael S.: *See—*
Salzer, Thomas E.; and Masheff, Michael S., 4,373,653, Cl. 228-104.000.

Mason, Stanley I., Jr.: *See—*
Kreager, William D.; and Mason, Stanley I., Jr., 4,373,982, Cl. 156-359.000.

Mason, William L.; and Russell, William K. Feed control system for pumping fluids to dishwashers and the like. 4,373,863, Cl. 417-12.000.

Massey-Ferguson Services N.V.: *See—*
McNaught, James B., 4,373,537, Cl. 130-27.00R.

Massey, Lester G.; Brabets, Robert I.; Abel, William A.; Anderson, James K.; Labus, Thomas J.; and George, Davis A., to CNG Research Company. System for pumping fluids at constant pressure. 4,373,864, Cl. 417-46.000.

Masuda, Teruo; Morita, Masayasu; Yamaguchi, Kazuyuki; and Harada, Yoshikazu, to France Bed Co., Ltd. Apparatus for chiropractic therapy and massage. 4,373,516, Cl. 128-57.000.

Matalia, Harshad D.; and Navi, Menashe, to American Newspaper Publishers Association. Method of high viscosity inking in rotary newspaper presses. 4,373,443, Cl. 101-221.000.

Mateja, Ludvik; and Chaloupka, Zdenek, to Motorpal Jihlava, narodni podnik. Arrangement for working internal rotational surfaces of metal parts in a cylindrical opening having a high slenderness ratio. 4,374,313, Cl. 219-69.00E.

Materna, Peter. High-efficiency non-tracking solar collector device. 4,373,513, Cl. 126-422.000.

Mathe, Istvan; and Kasper, Alan H., to Allied Corporation. Electrical connector including insulation-opening contact. 4,373,769, Cl. 339-97.00R.

Mathews, Harlan P.: *See—*
Bildstein, Carl R.; Heibein, Harry P.; and Mathews, Harlan P., 4,374,386, Cl. 346-75.000.

Mathues, Thomas P., to General Motors Corporation. Controlled slip torque converter clutch. 4,373,617, Cl. 192-3.310.

Matlock, Gordon E.; and Hornkohl, Owen T., to Moehlenpah Industries, Inc. Apparatus for end-plating elongate members such as railroad ties. 4,373,652, Cl. 227-100.000.

Matson, Wayne R., to Environmental Sciences Associates, Inc. Testing reagent. 4,374,041, Cl. 436-60.000.

Matsufuji, Yohji: *See—*
Eida, Tsuyoshi; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Ohta, Tokuya, 4,373,954, Cl. 106-20.000.

Matsumoto, Toru: *See—*
Kuge, Tsukasa; Matsumoto, Toru; Watanabe, Tsuyoshi; and Tamura, Yasuyuki, 4,373,469, Cl. 118-652.000.

Matsumura, Kazuaki; and Nakanishi, Seiki, to New Nippon Electric Company, Ltd. Electrical circuit wiring arrangement and its soldering method. 4,373,260, Cl. 29-840.000.

Matsuno, Yoshio, to Nissan Motor Co., Ltd. Dash panel construction. 4,373,745, Cl. 280-752.000.

Matsuoka, Hideoki: *See—*
Miki, Hiroyuki; and Matsuoka, Hideoki, 4,373,749, Cl. 280-807.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kunihiro, Yukitoshi, 4,373,677, Cl. 241-37.500.
Nagamoto, Shunichi, 4,373,392, Cl. 73-336.500.
Oshima, Mitsuaki; Neichi, Yutaka; Iga, Atsushi; and Wada, Ryoichi, 4,374,403, Cl. 360-113.000.
Yamashita, Akira; and Hiroyuki, Nagai, 4,374,398, Cl. 358-143.000.

Matsushita Electric Works, Ltd.: *See—*
Nakamura, Yoshimitsu, 4,373,256, Cl. 29-598.000.
Okahashi, Keiji; Motoyama, Masanori; and Furukawa, Satoru, 4,374,311, Cl. 200-269.000.

Matsushita, Yoshio, to Iwata Air Compressor Manufacturing Company Ltd. Worm-type rotary fluid compressor. 4,373,881, Cl. 418-195.000.

Matsuura, Tsuyoshi; Fujiwara, Hiroshi; Aihara, Mamoru; Takahashi, Yutaka; and Nakajima, Yoshio, to Olympus Optical Company Ltd. Film end detector for use in automatic film winding camera. 4,373,796, Cl. 354-173.000.

Mattauch, Robert J.: *See—*
United States of America, National Aeronautics and Space Administration; Mattauch, Robert J.; and Seabaugh, Alan C., 4,373,989, Cl. 156-635.000.

Mattel, Inc.: *See—*
Douglas, Raymond J.; May, Herbert; Poznick, Jeffrey B.; and Sweet, Roger H., 4,373,289, Cl. 46-1.00R.

Mattuck, Morris; and Comte, Rheal, to Canadian General Electric Company Limited. Cut-out fuse tube. 4,373,555, Cl. 138-140.000.

Maui Land & Pineapple Company, Inc.: *See—*
Tsutsumi, Masato, 4,373,432, Cl. 99-542.000.

Maurer, Herman J., to J. I. Case Company. Quick coupling and release mechanism for buckets. 4,373,852, Cl. 414-723.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Bauser, Elisabeth; Frik, Martina; Lochner, Karl S.; and Schmidt, Laurenz, 4,373,988, Cl. 156-622.000.

Maxs AG: *See—*
Greutert, Albert, 4,374,026, Cl. 210-493.500.

May & Baker Limited: *See—*
Hill, Jack; Sharp, Brian W.; Warburton, Dennis; Walker, Robert B., deceased; and Walker, Thomas, administrator, 4,374,136, Cl. 424-251.000.

May, Herbert: *See—*
Douglas, Raymond J.; May, Herbert; Poznick, Jeffrey B.; and Sweet, Roger H., 4,373,289, Cl. 46-1.00R.

Mayer, Edward F.; Diamond, Arthur S.; and Chang, Paul, to Ricoh Company, Ltd. Carrier coating compositions of butadiene-acrylonitrile rubber and polyurethane. 4,374,192, Cl. 430-108.000.

Mayer, Walter P.: *See—*
Berger, Mitchell H.; Mayer, Walter P.; and Ward, Robert J., 4,374,237, Cl. 528-28.000.

Mayo, John H. Test tool for sub-sea well head housings and method of testing. 4,373,380, Cl. 73-40.50R.

Maysteel Corporation: *See—*
Janos, Alfred G., 4,373,324, Cl. 59-78.100.

McAndrew, James R. CFC Expansion arch. 4,373,913, Cl. 433-7.000.

McBride, Edward D.: *See—*
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., 4,373,920, Cl. 440-59.000.
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., 4,373,921, Cl. 440-61.000.

McCarter, Robert J., to United States of America, Commerce. Smolder and flame resistant insulation materials, composition and method. 4,374,171, Cl. 428-288.000.

McCartney, Joseph F.; Jones, Thomas E.; and Johnson, Leopold J., to United States of America, Navy. Polymer packaged cell in a sack. 4,374,186, Cl. 429-154.000.

McClellan, Thomas R.: *See—*
Ewen, James H.; McClellan, Thomas R.; McMillin, Michael H.; and Murray, Pat L., 4,374,210, Cl. 521-159.000.

McClintic, Robert P.: *See—*
Kim, Tai K.; MacInnis, Martin B.; McClintic, Robert P.; and Vogt, Martin C., 4,374,099, Cl. 423-54.000.

McClure, B. Thompson, to Honeywell Inc. Chemical bias agent detection. 4,374,090, Cl. 422-98.000.

McCombs, Norman R., to Greene & Kellogg, Incorporated. Modular industrial oxygen concentrator. 4,373,938, Cl. 55-160.000.

McCrink, Michael P. Signalling means for a crustacean trap. 4,373,288, Cl. 43-100.000.

McDermott Incorporated: *See—*
Haney, James A., 4,373,835, Cl. 405-195.000.

McDonald, Patrick E.: *See—*
Bollfrass, Charles A.; Landriault, Leonard S.; and McDonald, Patrick E., 4,373,754, Cl. 285-334.000.

McDonnell Douglas Corporation: *See—*
Barajas, Felix, 4,373,974, Cl. 148-24.000.

McElroy, David J., to Texas Instruments Incorporated. Method of making high density semiconductor device such as floating gate electrically programmable ROM or the like. 4,373,248, Cl. 29-571.000.

McEntire, Edward E., to Texaco Development Corporation. Process for converting substituted ethylene carbonates into substituted ethylene oxides using tin catalysts. 4,374,259, Cl. 549-518.000.

McGarry, Errol J., to ICI Australia Limited. Process for the preparation of γ-unsaturated carboxylates. 4,374,264, Cl. 560-205.000.

McGinn, Michael, to Motorola, Inc. Integrated horizontal oscillator employing an on-chip capacitor for use in a television receiver. 4,374,366, Cl. 331-111.000.

McGinnis, James L.; and Conciatori, Anthony B., to Celanese Corporation. Preparation of hydroxy aromatic carboxylic acids and ester derivatives thereof. 4,374,262, Cl. 560-56.000.

McGregor, Charles W.; and Summers, Stephen E., to Essex Group, Inc. High solids polyamide-imide magnet wire enamel. 4,374,221, Cl. 524-94.000.

McGuckin, Hugh G.; Hartman, Susan E.; and Specht, Donald P., to Eastman Kodak Company. Dye imbibition photohardenable imaging material and process for forming positive dye images. 4,374,194, Cl. 430-199.000.

McGuire, Michael T.: *See*—
Cole, Bruce A.; Levine, Harold I.; McGuire, Michael T.; Nelson, Kathleen J.; and Slade, Louise, 4,374,154, Cl. 426-565.000.

McKee, Donald H.: *See*—
Edwards, Robert E.; McKee, Donald H.; and Brown, Claude D., 4,373,363, Cl. 69-28.000.

McKenzie, Joseph A., Jr. Component mask for printed circuit boards and method of use thereof. 4,373,655, Cl. 228-180.00R.

McKinley, John T., to Foundry & Steel, Inc. Two speed transmission. 4,373,927, Cl. 474-74.000.

McKinnis, John F., Jr.: *See*—
Miller, Norman; and McKinnis, John F., Jr., 4,373,450, Cl. 109-75.000.

McMahon, Paul E.: *See*—
Kim, Sang N.; McMahon, Paul E.; Riggs, John P.; and Rhodes, John M., 4,374,114, Cl. 423-447.100.

McMahon, Roy C., to Electrostatic Equipment Company. Treatment of fluid hydrocarbon fuels with electric fields. 4,373,494, Cl. 123-538.000.

McMillan, John C.: *See*—
Nussdorf, Jeffrey M.; and McMillan, John C., 4,373,570, Cl. 160-352.000.

McMillen, Russell G., to International Harvester Co. Heat exchanger assembly. 4,373,577, Cl. 165-122.000.

McMillin, Michael H.: *See*—
Ewen, James H.; McClellan, Thomas R.; McMillin, Michael H.; and Murray, Pat L., 4,374,210, Cl. 521-159.000.

McNaught, James B., to Massey-Ferguson Services N.V. Grain separating apparatus. 4,373,537, Cl. 130-27.00R.

Mead Corporation, The: *See*—
Oliff, James R., 4,373,630, Cl. 206-434.000.
Wood, Prentice J., 4,373,627, Cl. 206-201.000.

Meckel, Joachim F.: *See*—
Flockenhaus, Claus; Galow, Manfred; Meckel, Joachim F.; and Joseph, Horst G., 4,373,997, Cl. 202-230.000.

Medalie Manufacturing Co.: *See*—
Petersen, Ross K., 4,373,940, Cl. 55-328.000.

Medina, Mario, to Rosen, Harry. Process for waste water purification. 4,374,028, Cl. 210-669.000.

Medtronic, Inc.: *See*—
Markowitz, Harold T., 4,374,382, Cl. 340-870.010.

Meetham, Geoffrey W.; and Gray, John D., to Rolls-Royce Limited. Alloy composition suitable for use in making castings, and a casting made therefrom. 4,374,084, Cl. 420-449.000.

Mei, Joseph S.: *See*—
Pitrolo, Augustine A.; Mei, Joseph S.; and Shang, Jerry Y., 4,373,454, Cl. 110-347.000.

Meier, Erwin: *See*—
Horler, Hansulrich; and Meier, Erwin, 4,373,336, Cl. 60-606.000.

Melinat, Wolfgang, to General Motors Corporation. Laminated disc brake pad assembly. 4,373,615, Cl. 188-73.100.

Menard, Marcel; and Martel, Alain, to Bristol-Myers Company. Antibacterial agents of the β-lactam type. 4,374,065, Cl. 260-245.20R.

Mensink, Kornelis A.: *See*—
Wittkampf, Frederik H. M.; Mensink, Kornelis A.; and Brouwer, Hendrik L., 4,373,531, Cl. 128-419.0PG.

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Baldwin, John J.; Ponticello, Gerald S.; Vickers, Stanley; and Steuerwald, Alfred, 4,374,140, Cl. 424-263.000.
Igoe, Robert S.; and Taylor, Richard J., 4,374,155, Cl. 426-569.000.
Larson, Vivian M.; and Lehman, E. Dale, 4,374,127, Cl. 424-89.000.
Nutt, Ruth F., 4,374,060, Cl. 260-112.50R.

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Draenert, Klaus, 4,373,217, Cl. 3-1.900.

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Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,374,244, Cl. 542-476.000.

Merrell Toraude et Compagnie: *See*—
Bey, Philippe; Jung, Michel; Kolb, Michael; and Danzin, Charles, 4,374,128, Cl. 424-180.000.

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Nelson, Ronald C.; and Merrick, Richard L., Jr., 4,373,719, Cl. 273-1.00E.

Mertens, Walter; Thubeauville, Heinz; and Glittenberg, Wilhelm, to Dr. C. Otto & Comp. G.m.b.H. Method for renewing the brickwork of coke ovens. 4,373,244, Cl. 29-402.080.

Messerschmitt, Elmar. Heatable sieve for screen printing. 4,373,441, Cl. 101-127.100.

Messina, Giuseppe; Moretti, Mario D.; and Lorenzoni, Loreno, to Euteco Impianti S.p.A. Process for the preparation of dicumyl peroxide. 4,374,279, Cl. 568-558.000.

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Meyer, Friedheim: *See*—
Giepen, Ulrich; and Meyer, Friedhelm, 4,374,380, Cl. 340-660.000.

Meyer, Louis W., to Dow Chemical Company, The. Compositions containing mold release agents. 4,374,222, Cl. 524-241.000.

Meyerle, Michael: *See*—
Ehrlinger, Friedrich; and Meyerle, Michael, 4,373,359, Cl. 74-687.000.

Mibae, Jiro: *See*—
Taniguchi, Takashi; and Mibae, Jiro, 4,374,158, Cl. 427-41.000.

Michael, Richard A., to Deere & Company. Floating manifold. 4,373,622, Cl. 192-85.0AA.

Michalski, William J. Enclosure arrangement for warmed footwear. 4,373,274, Cl. 36-2.600.

Michels, Albertus P. J.: *See*—
Asselman, George A. A.; and Michels, Albertus P. J., 4,373,343, Cl. 62-238.600.

Michie, William J., Jr., to Union Carbide Corporation. Extruded gloss improvement in pipe blends with low pressure low density polyethylene. 4,374,227, Cl. 524-528.000.

Microlife Technics, Inc.: *See*—
Olsen, Ronald H., 4,374,200, Cl. 435-172.000.

Middaugh, James F.: *See*—
Mowles, Donald L.; Middaugh, James F.; Rutnarak, Sangvorn; and Genese, Joseph N., 4,373,559, Cl. 141-18.000.

Miki, Hiroyuki; and Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Seat belt retractor. 4,373,749, Cl. 280-807.000.

Mikoshiba, Hitoshi, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Character ring-selecting type printer. 4,373,439, Cl. 101-93.090.

Mildoy Enterprises: *See*—
Miller, Lester, 4,373,223, Cl. 7-151.000.

Miles, Derek A.; and Miles, Julie M. T. Cooking vessel. 4,373,511, Cl. 126-369.000.

Miles, Julie M. T.: *See*—
Miles, Derek A.; and Miles, Julie M. T., 4,373,511, Cl. 126-369.000.

Miletech, Inc.: *See*—
Re, Ronald, 4,373,502, Cl. 123-512.000.

Miller, Charles D. Loudspeaker cone stiffeners. 4,373,607, Cl. 181-166.000.

Miller, Franklyn D.; and Muller, Werner C., to National Distillers & Chemical Corp. Rapid utilization of disaccearides by fermentation. 4,374,198, Cl. 435-162.000.

Miller, James A.: *See*—
Reid, Taylor A.; Miller, James A.; and Barber, Duane G., 4,373,813, Cl. 356-326.000.

Miller, Leonard A., Jr., to Giddings & Lewis, Inc. Pallet transfer system. 4,373,840, Cl. 414-225.000.

Miller, Lester, to Mildoy Enterprises. Container opener. 4,373,223, Cl. 7-151.000.

Miller, Norman; and McKinnis, John F., Jr., to Schwab Safe Co., Inc. Diskette safe. 4,373,450, Cl. 109-75.000.

Milli, Ottavio. System for thread guiding in winding machines. 4,373,686, Cl. 242-158.200.

Milliken Research Corporation: *See*—
Kluger, Edward W.; and Rolen, Jack L., 4,374,068, Cl. 260-465.00D.

Mills, Ned D., to Varitran, Inc. Variable ratio fluid-mechanical drive apparatus. 4,373,408, Cl. 74-687.000.

Minet, Gunter: *See*—
Schwarz, Herwig. J.; Burde, Hans-Jurgen H.; and Minet, Gunter, 4,374,172, Cl. 428-308.400.

Minnesota Mining and Manufacturing Company: *See*—
Errede, Louis A.; Stoesz, James D.; and Winter, George D., deceased, 4,373,519, Cl. 128-156.000.
Kerfeld, Donald J., 4,374,077, Cl. 264-22.000.
Patterson, Richard A., 4,373,978, Cl. 156-69.000.

Minolta Camera Co., Ltd.: *See*—
Taniguchi, Nobuyuki; and Yuasa, Yoshio, 4,373,793, Cl. 354-31.000.
Yuge, Shizuo; Kitou, Nobuo; Yamamoto, Toshio; and Kanesaka, Michiru, 4,373,802, Cl. 355-14.0FU.

Minophagen Pharmaceutical Company: *See*—
Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, 4,374,284, Cl. 568-817.000.

Mir, Jose M., to Eastman Kodak Company. Light valve devices and electronic imaging/scan apparatus with locationally-interlaced optical addressing. 4,374,397, Cl. 358-75.000.

Misawa, Mitsukuni: *See*—
Onda, Takanori; Kawasaki, Hiroshi; and Misawa, Mitsukuni, 4,373,601, Cl. 180-226.000.

Misono, Masayoshi; and Kitamura, Shigeki, to Hitachi, Ltd. Color picture tube with electrically conductive frit film on envelope surface. 4,374,344, Cl. 313-479.000.

Missout, Gilles, to IREQ—Institut de Recherche de l'Hydro-Quebec. System and method of sensing current in high voltage transmission lines utilizing the transmission of digital information by optical fibers. 4,374,359, Cl. 324-96.000.

Mitchell, Edward J. Airstream heater. 4,373,912, Cl. 432-222.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Ishii, Toshiaki, 4,373,610, Cl. 187-29.00R.
Kamahara, Koichi, 4,374,393, Cl. 357-30.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Fujiwara, Haruyoshi, 4,373,993, Cl. 162-347.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Negishi, Hideo; Goto, Kaoru; and Takaya, Sueji, 4,373,839, Cl. 408-59.000.
Mitsubishi Pencil Co., Ltd.: *See*—
Kawakubo, Takamasa; and Hirasawa, Kiyosi, 4,374,225, Cl. 524-302.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Yuasa, Teruo; Yamazaki, Noboru; and Morimoto, Yoshio, 4,374,272, Cl. 564-315.000.
Mitzel, Wilhelm, to GAO Gesellschaft fur Automation und Organisation mbH. Apparatus for transporting sheet material. 4,373,712, Cl. 271-272.000.
Miyakawa, Hideaki: *See*—
Miyake, Kanichi; Tokuda, Masahiro; Aoki, Takaaki; Miyakawa, Hideaki; and Tamura, Yasuo, 4,374,217, Cl. 524-47.000.
Miyake, Kanichi; Tokuda, Masahiro; Aoki, Takaaki; Miyakawa, Hideaki; and Tamura, Yasuo, to Hohnen Oil Co., Ltd. Cold-setting starch adhesive. 4,374,217, Cl. 524-47.000.
Miyashita, Hideo: *See*—
Inaba, Hajimu; and Miyashita, Hideo, 4,374,349, Cl. 318-568.000.
Miyashita, Ikuro: *See*—
Obara, Sanshiro; and Miyashita, Ikuro, 4,373,379, Cl. 73-40.50R.
Miyata, Toshiyuki: *See*—
Hirashima, Tsuneaki; and Miyata, Toshiyuki, 4,374,250, Cl. 548-305.000.
Miyawaki, Kiyoshige: *See*—
Inamori, Kazuo; and Miyawaki, Kiyoshige, 4,374,316, Cl. 219-209.000.
Miyoshi, Shoichi: *See*—
Inamoto, Hiroshi; Sobajima, Katsunobu; and Miyoshi, Shoichi, 4,373,826, Cl. 403-14.000.
Moates, Roger D., to Westinghouse Electric Corp. Matrix encoder for resistive sensor arrays. 4,374,384, Cl. 340-870.380.
Moatti, Georges. Hydraulic engine. 4,373,425, Cl. 91-227.000.
Mobay Chemical Corporation: *See*—
Sivaramakrishnan, Parameswar, 4,374,226, Cl. 524-399.000.
Mobil Oil Corporation: *See*—
Chu, Chin-Chiun, 4,374,045, Cl. 252-455.00Z.
Chu, Chin-Chiun, 4,374,294, Cl. 585-466.000.
Dellinger, Thomas B.; and Kelly, John, Jr., 4,373,592, Cl. 175-61.000.
Fitch, John L.; and Mullins, Lynn D., 4,373,585, Cl. 166-263.000.
Gemmill, Robert M.; and Horodysky, Andrew G., 4,374,032, Cl. 252-49.600.
Haag, Werner O.; and Lago, Rudolph M., 4,374,296, Cl. 585-739.000.
Hunt, William C., III, 4,373,586, Cl. 166-263.000.
Klosek, John M.; and Wu, Margaret M., 4,374,297, Cl. 585-868.000.
Lee, Carol S., 4,374,295, Cl. 585-640.000.
Rollmann, Louis D.; and Valyocsik, Ernest W., 4,374,093, Cl. 422-202.000.
Mochizuki, Manabu: *See*—
Kamiyama, Shin-ichi; Ohshima, Kiyoshi; Mochizuki, Manabu; Kato, Kazuyuki; and Saito, Takeshi, 4,373,800, Cl. 355-10.000.
Modern Home Products Corp.: *See*—
Koziol, Walter, 4,373,505, Cl. 126-39.00E.
Modine Manufacturing Company: *See*—
Saperstein, Zalman P.; El-Bourini, Refki M.; and Munch, John E., Jr., 4,373,578, Cl. 165-141.000.
Schey, John A., 4,373,369, Cl. 72-347.000.
Moehlenpah Industries, Inc.: *See*—
Matlock, Gordon E.; and Hornkohl, Owen T., 4,373,652, Cl. 227-100.000.
Mohacsi, Ernest, to Hoffmann-La Roche Inc. Levorotatory N-substituted acylmorphinans useful as analgesic agents. 4,374,139, Cl. 424-260.000.
Mohrbach, Hans, to Ernst Mohrbach KG. Punch press apparatus for placement and alignment of a knife holder. 4,373,413, Cl. 83-123.000.
Molders, Werner, to Stabilus GmbH. Construction including a gas spring. 4,373,707, Cl. 267-64.120.
Molins, Desmond W.; Hinchcliffe, Dennis; Heybourn, Frank; and Coyte, Raymond G., to Molins Limited. Cigarette conveyor systems. 4,373,624, Cl. 198-347.000.
Molins Limited: *See*—
Molins, Desmond W.; Hinchcliffe, Dennis; Heybourn, Frank; and Coyte, Raymond G., 4,373,624, Cl. 198-347.000.
Monroe, John E., to Displaymor Manufacturing Company, Inc. Dual refrigerated display cabinet. 4,373,355, Cl. 62-256.000.
Monsanto Company: *See*—
Cohen, Saul M.; and LeBlanc, John R., 4,374,240, Cl. 528-230.000.
Montedison S.p.A.: *See*—
Basile, Giampiero; Boero, Giancarlo; Ceresa, Emiliano M.; and Montino, Franco, 4,374,118, Cl. 423-607.000.
Monteillet, Denis, to Societe Anonyme de Recherches de Mecanique Appliquee. Connecting rod or similar object having a hollow body. 4,373,832, Cl. 403-374.000.
Montino, Franco: *See*—
Basile, Giampiero; Boero, Giancarlo; Ceresa, Emiliano M.; and Montino, Franco, 4,374,118, Cl. 423-607.000.
Moore, L. Dow: *See*—
Hsu, Ed C.; Moore, L. Dow; and Temple, Chester S., 4,374,177, Cl. 428-392.000.
Moore, Ronald D., to Chivas Products, Limited. Fastening system for assist straps and the like. 4,373,229, Cl. 16-125.000.
Moore, Wildey J. Gas operated mechanism having automatic pressure regulator. 4,373,423, Cl. 89-191.00A.
Moran, Daniel B.; and Albright, Jay D., to American Cyanamid Company. [4R]-3-(ω-Aroylpropionyl)-4-thiazolidinecarboxylic acids and esters. 4,374,249, Cl. 548-201.000.
Moretti, Mario D.: *See*—
Messina, Giuseppe; Moretti, Mario D.; and Lorenzoni, Loreno, 4,374,279, Cl. 568-558.000.
Messina, Giuseppe; Moretti, Mario D.; and Lorenzoni, Loreno, 4,374,280, Cl. 568-558.000.
Morgan, Morris H.: *See*—
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., 4,373,272, Cl. 34-57.00A.
Morgan, Raleigh E. Solar collector. 4,373,515, Cl. 126-438.000.
Morimoto, Yoshio: *See*—
Yuasa, Teruo; Yamazaki, Noboru; and Morimoto, Yoshio, 4,374,272, Cl. 564-315.000.
Morishige, Morio, to Casio Computer Co., Ltd. Electronic timepiece generating different alarm sounds for respective different regions. 4,373,821, Cl. 368-21.000.
Morishita, Hirosada: *See*—
Mukoh, Akio; Morishita, Hirosada; Anzai, Masayasu; Tokunaga, Kazuyoshi; and Kikuchi, Yasuo, 4,374,191, Cl. 430-100.000.
Morishita, Teru; Ishioka, Yoshimichi; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,373,672, Cl. 239-703.000.
Morishita, Teru; Sugiyama, Matuyosi; Sato, Akira; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,373,673, Cl. 239-703.000.
Morita, Masayasu: *See*—
Masuda, Teruo; Morita, Masayasu; Yamaguchi, Kazuyuki; and Harada, Yoshikazu, 4,373,516, Cl. 128-57.000.
Moriya, Takeo; and Yamagata, Toshio, to Kimoto & Co., Ltd. Photosensitive material and process for developing the same. 4,374,193, Cl. 430-149.000.
Morooka, Yasuo: *See*—
Tanimoto, Sunao; Tanifuji, Shinya; and Morooka, Yasuo, 4,373,364, Cl. 72-8.000.
Morris, Anthony F.: *See*—
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Morrow, George W., Jr.: *See*—
Stricklin, Hazel R.; and Morrow, George W., Jr., 4,374,174, Cl. 428-341.000.
Morsbach, Martin; Stecher, Friedhelm; and Stocker, Eberhard, to Goetze AG. Soft material sealing disc used as head gasket. 4,373,735, Cl. 277-235.00B.
Mortoly, John L., to James L. Taylor Mfg. Co. Liquid adhesive applicator. 4,374,165, Cl. 427-430.100.
Morvue, Inc.: *See*—
Laib, Donald L., 4,373,816, Cl. 356-375.000.
Motorola, Inc.: *See*—
Darnell, Robert D.; and Ingle, William M., 4,374,110, Cl. 423-342.000.
McGinn, Michael, 4,374,366, Cl. 331-111.000.
Olesin, Andrew; Luke, Kevin K. L.; and Lee, Robert D., 4,374,357, Cl. 323-351.000.
Popovski, George N.; and Vizmuller, Peter, 4,374,370, Cl. 333-202.000.
Motorpal Jihlava, narodni podnik: *See*—
Mateja, Ludvik; and Chaloupka, Zdenek, 4,374,313, Cl. 219-69.00E.
Motoyama, Masanori: *See*—
Okahashi, Keiji; Motoyama, Masanori; and Furukawa, Satoru, 4,374,311, Cl. 200-269.000.
Motsch, Hans, to Wurttembergishche Metallwarenfabrik. Process for mounting components with surface junctions to printed-circuit boards. 4,373,259, Cl. 29-840.000.
Motter Printing Press Co.: *See*—
Loebach, Michael H., 4,373,713, Cl. 271-303.000.
Mowles, Donald L.; Middaugh, James F.; Rutnarak, Sangvorn; and Genese, Joseph N., to Abbott Laboratories. Apparatus for pressurizing an additive transfer device. 4,373,559, Cl. 141-18.000.
Moy, Francis L.: *See*—
Hiltz, Arnold A.; and Moy, Francis L., 4,374,081, Cl. 264-102.000.
Mroz, Krzysztof: *See*—
Skalmierski, Bogdan; and Mroz, Krzysztof, 4,373,980, Cl. 156-160.000.
Mubarakshin, Gadylsha M.: *See*—
Alexandrov, Sasho P.; Mubarakshin, Gadylsha M.; Volf, Leonard A.; and Burinsky, Stanislav V., 4,374,204, Cl. 521-28.000.
Mueller, Dale A., to Honeywell Inc. Heat pump system adaptive defrost control system. 4,373,349, Cl. 62-156.000.
Mukoh, Akio; Morishita, Hirosada; Anzai, Masayasu; Tokunaga, Kazuyoshi; and Kikuchi, Yasuo, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Dry reversal developer for electrostatic photography and electrostatic photographic method using the same. 4,374,191, Cl. 430-100.000.
Mules, Robert S., to Fram Europe Limited. Filters. 4,373,635, Cl. 206-525.000.
Muller, Josef, to Balzer & Droll, KG. Process and device for forming the winding cores of stators or rotors of electric machines. 4,373,257, Cl. 29-736.000.
Muller, Rolf, to Papst Motoren KG. Brushless d-c motor system. 4,374,347, Cl. 318-138.000.
Muller, Werner C.: *See*—
Miller, Franklyn D.; and Muller, Werner C., 4,374,198, Cl. 435-162.000.

Mullins, Lynn D.: *See*—
Fitch, John L.; and Mullins, Lynn D., 4,373,585, Cl. 166-263.000.
Munch, John E., Jr.: *See*—
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Murase, Shigemitsu: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,374,031, Cl. 252-8.800.
Murata Manufacturing Co., Ltd.: *See*—
Sakamoto, Yukio; Tanaka, Tetsuo; Kuboto, Masaaki; and Sugitani, Masami, 4,374,369, Cl. 333-182.000.
Murbach, Warren J.: *See*—
Heller, Carl A.; and Murbach, Warren J., 4,374,189, Cl. 430-2.000.
Murray, Pat L.: *See*—
Ewen, James H.; McClellan, Thomas R.; McMillin, Michael H.; and Murray, Pat L., 4,374,210, Cl. 521-159.000.
Musashi Seimitsu Kogyo Kabushiki Kaisha: *See*—
Nemoto, Akira, 4,373,876, Cl. 417-534.000.
Muscatine Lighting Mfg. Co., Inc.: *See*—
Drost, Jim L.; and Gordin, Myron K., 4,374,407, Cl. 362-432.000.
Mutschele, Hans-Ulrich: *See*—
Kemmner, Ulrich; Ringwald, Peter; Mutschele, Hans-Ulrich; and Schillinger, Rainer, 4,373,877, Cl. 417-312.000.
Myrick, Edward E. Single line deep-sea bucket and release. 4,373,278, Cl. 37-71.000.
Nabisco Brands, Inc.: *See*—
Stroz, John J.; and Mackay, Donald A. M., 4,374,122, Cl. 424-48.000.
Nadherny, Rudolph E.: *See*—
Adler, Franklin P.; and Nadherny, Rudolph E., 4,373,841, Cl. 410-34.000.
Naefe, Gerhard: *See*—
Borburgh, Jacques; Naefe, Gerhard; and Rost, Helmut, 4,373,395, Cl. 73-607.000.
Naf, Regula; Pickenhagen, Wilhelm; and Morris, Anthony F., to Firmenich SA. Utilization of nitrogen containing heterocyclic derivatives as perfume ingredients. 4,374,051, Cl. 252-522.00R.
Nagamoto, Shunichi, to Matsushita Electric Industrial Co., Ltd. Sensor control circuit. 4,373,392, Cl. 73-336.500.
Naito, Hideshi: *See*—
Nozawa, Hideyo; Naito, Hideshi; and Kazami, Kazuyuki, 4,373,792, Cl. 354-33.000.
Naito, Katsumi, to Nissan Motor Co., Ltd.; and NSK-Warnar K.K. Belt retractor. 4,373,684, Cl. 242-107.600.
Nakajima, Motoki: *See*—
Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, 4,374,052, Cl. 252-522.00R.
Nakajima, Yoshihiro: *See*—
Bandai, Shinji; Kajimaki, Masao; Nakajima, Yoshihiro; Yagi, Akira; and Nishimura, Haruo, 4,373,224, Cl. 15-1.50A.
Nakajima, Yoshio: *See*—
Matsuura, Tsuyoshi; Fujiwara, Hiroshi; Aihara, Mamoru; Takahashi, Yutaka; and Nakajima, Yoshio, 4,373,796, Cl. 354-173.000.
Nakamura, Masakazu, to Sumitomo Precision Products Co. Ltd. Method of forming reinforced plate-type heat exchanger. 4,373,243, Cl. 29-157.30D.
Nakamura, Yoshimitsu, to Matsushita Electric Works, Ltd. Method of making rotor coil of coreless motor. 4,373,256, Cl. 29-598.000.
Nakanishi, Seiki: *See*—
Matsumura, Kazuaki; and Nakanishi, Seiki, 4,373,260, Cl. 29-840.000.
Nakaso, Yasuji; Tanaka, Kyoji; and Kawamoto, Hiromi, to Central Glass Company, Limited. Process of preparing alkali monofluorophosphate. 4,374,108, Cl. 423-301.000.
Nakazeki, Tsugito: *See*—
Kimata, Kei; and Nakazeki, Tsugito, 4,373,490, Cl. 123-452.000.
Nalco Chemical Company: *See*—
Connelly, Lawrence J.; Kane, James; and Shields, R. James, 4,374,102, Cl. 423-206.00T.
Nalepa, Roger A.; and Casale, Michael A., to Hewlett-Packard Company. Mass flow/pressure control system. 4,373,549, Cl. 137-487.500.
Nanba, Mitsuo; Ogirima, Masahiko; Kozuka, Hirotsugu; and Shintani, Akira, to Hitachi, Ltd. Method of diffusing an impurity. 4,373,975, Cl. 148-189.000.
Nanometrics Incorporated: *See*—
Coates, Vincent J., 4,373,817, Cl. 356-384.000.
Narancic, Vojislav, to Kearney-National, Inc. Cadmium electric fuse. 4,374,371, Cl. 337-159.000.
Narato, Kiyoshi; Ohtsuka, Keizo; and Niwa, Sadahiko, to Hitachi, Ltd. Method and apparatus for diagnosing overheating of an electric machine. 4,373,376, Cl. 73-23.100.
Nash, Edgar M., Jr. Water-tight rigid structural panel. 4,373,313, Cl. 52-397.000.
Natansohn, Samuel; and Czupryna, Gary, to GTE Laboratories Incorporated. Process for separating tungsten from coinage metals. 4,374,008, Cl. 204-109.000.
Nathan, Bernard D.; and Witter, Donald R., to General Electric Company. Method for fabricating a transverse magnetic printing head. 4,374,005, Cl. 204-15.000.
National Distillers & Chemical Corp.: *See*—
Miller, Franklyn D.; and Muller, Werner C., 4,374,198, Cl. 435-162.000.
National Semiconductor Corporation: *See*—
Khadder, Wadie N.; Wang, Jia-Tarng; and Solomon, James E., 4,373,253, Cl. 29-576.00B.
Navi, Menashe: *See*—
Matalia, Harshad D.; and Navi, Menashe, 4,373,443, Cl. 101-221.000.
NCR Corporation: *See*—
Smigelski, Thomas S., 4,373,965, Cl. 148-1.500.
Neat Nap, Inc.: *See*—
Pelura, Carme D., 4,373,292, Cl. 46-153.000.
Negishi, Hideo; Goto, Kaoru; and Takaya, Sueji, to Mitsubishi Kinzoku Kabushiki Kaisha. Drill bit. 4,373,839, Cl. 408-59.000.
NEHA International: *See*—
Holland, Larry D., 4,374,097, Cl. 423-22.000.
Neichi, Yutaka: *See*—
Oshima, Mitsuaki; Neichi, Yutaka; Iga, Atsushi; and Wada, Ryoichi, 4,374,403, Cl. 360-113.000.
Neissel, John P.: *See*—
Terhune, James H.; Sturtz, John P.; and Neissel, John P., 4,373,375, Cl. 73-19.000.
Neitzel, Emery W.; and Schumacher, Jerome A., to Greenheck Fan Corporation. High efficiency ventilation system. 4,373,509, Cl. 126-299.00D.
Nell, David J.: *See*—
Marquess, Gerald E.; and Nell, David J., 4,374,092, Cl. 422-199.000.
Nelson, Carl D., to J. I. Case Company. Automatic crab steering. 4,373,603, Cl. 180-236.000.
Nelson Industries, Inc.: *See*—
Jaisinghani, Rajan A., 4,374,029, Cl. 210-671.000.
Nelson, John F.: *See*—
Bettini, John E.; and Nelson, John F., 4,373,842, Cl. 411-377.000.
Nelson, Kathleen J.: *See*—
Cole, Bruce A.; Levine, Harold I.; McGuire, Michael T.; Nelson, Kathleen J.; and Slade, Louise, 4,374,154, Cl. 426-565.000.
Nelson, Norman A., to Putch, Samuel, a part interest. Well casing hanger assembly. 4,373,752, Cl. 285-141.000.
Nelson, Ronald C.; and Merrick, Richard L., Jr., to Fidelity Electronics, Ltd. Electronic bridge game system. 4,373,719, Cl. 273-1.00E.
Nemoto, Akira, to Musashi Seimitsu Kogyo Kabushiki Kaisha. Double-acting piston compressor. 4,373,876, Cl. 417-534.000.
Neuhalfen, Michael A., to General Motors Corporation. Internal combustion engine electronic ignition system. 4,373,488, Cl. 123-418.000.
New Nippon Electric Company, Ltd.: *See*—
Matsumura, Kazuaki; and Nakanishi, Seiki, 4,373,260, Cl. 29-840.000.
Newall Engineering Company Limited, The: *See*—
Parnum, John D.; and Barber, Nigel T., 4,373,301, Cl. 51-281.00C.
Newell, Gerald P., to Helene Curtis Industries, Inc. Hair moisturizing compositions. 4,374,125, Cl. 424-70.000.
Newman, Raymond J.: *See*—
March, Edward J.; and Newman, Raymond J., 4,373,658, Cl. 228-242.000.
Ng, Henry H.; and Schmidt, Frederick R., to Interaction Systems, Inc. Touch terminal with reliable pad selection. 4,374,381, Cl. 340-711.000.
Nguyen, Dung D.: *See*—
Zwick, Eugene B.; Nguyen, Dung D.; Brigham, William D.; and Hoffman, Kenneth, 4,373,896, Cl. 431-9.000.
Nicholas, Mark L.: *See*—
Blum, Patricia R.; and Nicholas, Mark L., 4,374,043, Cl. 252-435.000.
Nichols, Gary R.; and Kozlowski, John J., Jr., to Magnavox Government and Industrial Electronics Company. Rotational position and velocity sensing apparatus. 4,373,486, Cl. 123-414.000.
Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,374,166, Cl. 428-35.000.
Ninomiya, Joko. Waistline supportable dispenser for martial arts "shurikens" throwing stars. 4,373,649, Cl. 224-163.000.
Nippon Electric Co., Ltd.: *See*—
Tsuchiya, Takuichi; and Togo, Hiroshi, 4,374,346, Cl. 315-276.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Endo, Akinori; and Kato, Hirokazu, 4,373,416, Cl. 84-1.010.
Nippon Kogaku K.K.: *See*—
Nozawa, Hideyo; Naito, Hideshi; and Kazami, Kazuyuki, 4,373,792, Cl. 354-33.000.
Ohtsubo, Yoshiaki, 4,373,790, Cl. 354-24.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Date, Takasaburo; Maki, Toshimichi; Iguchi, Mitsuya; Iwamaru, Sumifusa; and Watanabe, Hisashi, 4,373,911, Cl. 432-152.000.
Kajikawa, Shuji; Kanai, Kazuo; and Ito, Haruo, 4,373,907, Cl. 432-83.000.
Ouchi, Chiaki; and Kohsaka, Yohji, 4,373,951, Cl. 75-123.00N.
Taira, Tadaaki; Ishihara, Toshio; and Takehara, Junichiro, 4,373,365, Cl. 72-52.000.
Nippon Oil Company, Ltd.: *See*—
Yuasa, Hitoshi; and Imai, Hirosuke, 4,374,243, Cl. 528-422.000.
Nippon Soken, Inc.: *See*—
Kitamura, Sotoo; Akita, Sigeyuki; and Kitagawa, Junji, 4,373,388, Cl. 73-301.000.
Tanaka, Taro; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,373,880, Cl. 418-150.000.
Yamamoto, Shinichi; and Ito, Toshihiko, 4,373,895, Cl. 425-461.000.
Nippon Steel Corporation: *See*—
Sawatani, Tadashi; Ishii, Mitsuo; and Yoshimura, Hirofumi, 4,373,971, Cl. 148-12.0EA.
Nishikawa, Yukio: *See*—
Fukahori, Kiyoshi; and Nishikawa, Yukio, 4,374,335, Cl. 307-521.000.

Nishimura, Haruo: *See—*
Bandai, Shinji; Kajimaki, Masao; Nakajima, Yoshihiro; Yagi, Akira; and Nishimura, Haruo, 4,373,224, Cl. 15-1.50A.

Nishimura, Yutaka; Kuroiwa, Hiroshi; Kirisawa, Tadashi; and Oyama, Yoshishige, to Hitachi, Ltd. Air flow meter. 4,373,387, Cl. 73-204.000.

Nishioka, Gary J. Bristle structure for brushes and brush assembly. 4,373,541, Cl. 132-84.00R.

Nissan Motor Company, Limited: *See—*
Fujishiro, Takeshi; Takeuchi, Kiyoshi; and Kita, Toru, 4,373,378, Cl. 73-35.000.
Hayashi, Yoshimasa, 4,373,485, Cl. 123-340.000.
Inamoto, Hiroshi; Sobajima, Katsunobu; and Miyoshi, Shoichi, 4,373,826, Cl. 403-14.000.
Kato, Shinichi; Tsuda, Hiroshi; Yamaki, Kiyoshi; Suzuki, Tadashi; and Kuwano, Fumiyoshi, 4,374,310, Cl. 200-61.540.
Kuribayashi, Yasushi, 4,373,335, Cl. 60-602.000.
Matsuno, Yoshio, 4,373,745, Cl. 280-752.000.
Miki, Hiroyuki; and Matsuoka, Hideoki, 4,373,749, Cl. 280-807.000.
Naito, Katsumi, 4,373,684, Cl. 242-107.600.
Okuyama, Hiroo, 4,373,746, Cl. 280-752.000.
Shimura, Kiichiro; Tamura, Takeo; Kido, Takayoshi; Hara, Hiroshi; and Tanaka, Morimasa, 4,374,348, Cl. 318-443.000.
Ushimura, Shoji, 4,373,498, Cl. 123-571.000.
Yamaguchi, Hiroshi, 4,373,489, Cl. 123-422.000.

Nitney Corporation: *See—*
Lang, Franklin D., 4,373,843, Cl. 412-10.000.

Nitz, Larry T., to General Motors Corporation. Solid state compass. 4,373,271, Cl. 33-361.000.

Niwa, Sadahiko: *See—*
Narato, Kiyoshi; Ohtsuka, Keizo; and Niwa, Sadahiko, 4,373,376, Cl. 73-23.100.

Nobbe, Volker: *See—*
Schepers, Bernhard; Nobbe, Volker; Schroder, Bernd; Borer, Werner; and Kullack, Manfred, 4,374,119, Cl. 423-625.000.

Noggle, Donald E.: *See—*
Kulp, Leon; and Noggle, Donald E., 4,373,381, Cl. 73-40.50R.

Nolan Systems, Inc.: *See—*
Hansen, Kenneth H.; and Conover, Louis S., Jr., 4,373,710, Cl. 270-55.000.

Noland, Joseph R., to General Electric Company. Heat pump control/defrost circuit. 4,373,350, Cl. 62-156.000.

Nonomura, Keisaku; Takamatsu, Toshiaki; Uede, Hisashi; and Wada, Tomio, to Sharp Kabushiki Kaisha. Electrode structure on a matrix type liquid crystal panel. 4,373,784, Cl. 350-336.000.

Norcros Investments Limited: *See—*
Cunnington, Harry, 4,373,444, Cl. 101-228.000.

Nordmann, Joseph. Apparatus for preparing bread dough. 4,373,892, Cl. 425-207.000.

North American Philips Consumer Electronics Corp.: *See—*
Say, Donald L., 4,374,341, Cl. 313-414.000.
Say, Donald L., 4,374,342, Cl. 313-414.000.

Northcraft, Richard D. Adjustable means for supporting combustible material. 4,373,508, Cl. 126-298.000.

Northern Telecom Limited: *See—*
Purdy, Michael L., 4,373,776, Cl. 350-96.200.
Salama, Amir, 4,374,004, Cl. 204-15.000.

Norwich Eaton Pharmaceuticals, Inc.: *See—*
Wright, George C.; and White, Ronald E., 4,374,246, Cl. 546-156.000.

Norwood Marking & Equipment Co., Inc.: *See—*
Shenoha, James L., 4,373,436, Cl. 101-27.000.

Nouguier, Robert: *See—*
Maldonado, Paul; Nouguier, Robert; Fayard, Jean-Claude; and Leger, Robert, 4,374,282, Cl. 568-672.000.

Novak, Robert W.: *See—*
Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., 4,374,107, Cl. 423-265.000.

Nozawa, Hideyo; Naito, Hideshi; and Kazami, Kazuyuki, to Nippon Kogaku K.K. Flashlight photographing device. 4,373,792, Cl. 354-33.000.

NSK-Warnar K.K.: *See—*
Naito, Katsumi, 4,373,684, Cl. 242-107.600.

NSK-Warner K.K.: *See—*
Ikesue, Haruyuki, 4,373,830, Cl. 403-284.000.

NTN Toyo Bearing Company, Limited: *See—*
Kimata, Kei; and Nakazeki, Tsugito, 4,373,490, Cl. 123-452.000.

Nussdorf, Jeffrey M.; and McMillan, John C. Portable fabric display booth assembly. 4,373,570, Cl. 160-352.000.

Nutt, Ruth F., to Merck & Co., Inc. Process for the preparation of cyclic hexapeptide. 4,374,060, Cl. 260-112.50R.

N.V. Philips' Gloeilampenfabrieken: *See—*
Vogten, Leonardus L. M.; and Willems, Leonardus F., 4,374,302, Cl. 179-1.0SM.

Obara, Sanshiro; and Miyashita, Ikuro, to Hitachi, Ltd. Method and apparatus for detecting defects in a water cooling system of a hydrogen-cooled dynamic electric machine. 4,373,379, Cl. 73-40.50R.

Occidental Chemical Corporation: *See—*
Fifolt, Michael J.; and Foster, Arthur M., 4,374,266, Cl. 562-456.000.
Fifolt, Michael J.; and Foster, Arthur M., 4,374,267, Cl. 562-456.000.

Occidental Research Corporation: *See—*
Dines, Martin B.; and DiGiacomo, Peter M., 4,374,242, Cl. 528-395.000.
Lee, Chang-Kuei, 4,373,994, Cl. 201-22.000.
Tipton, Ann B.; and Crosby, Alan C., 4,374,106, Cl. 423-231.000.

Ogawa, Hiroshi; Sato, Kazuhiro; Shibata, Norio; Oguri, Katsuhiko; Utida, Masayoshi; and Ono, Tsuyoshi, to Victor Company of Japan, Ltd. Stereo pickup with printed circuit coils mounted in a linear field. 4,374,433, Cl. 369-136.000.

Ogilvie, Jim W. Travel game. 4,373,732, Cl. 273-271.000.

Ogirima, Masahiko: *See—*
Nanba, Mitsuo; Ogirima, Masahiko; Kozuka, Hirotsugu; and Shintani, Akira, 4,373,975, Cl. 148-189.000.

Ogle, Peter C.: *See—*
Ferris, Donald L.; and Ogle, Peter C., 4,373,862, Cl. 416-61.000.

Oguri, Katsuhiko: *See—*
Ogawa, Hiroshi; Sato, Kazuhiro; Shibata, Norio; Oguri, Katsuhiko; Utida, Masayoshi; and Ono, Tsuyoshi, 4,374,433, Cl. 369-136.000.

Ohara, Saburo: *See—*
Aoki, Kiyoshi; and Ohara, Saburo, 4,374,176, Cl. 428-392.000.

Ohkubo, Toyokazu: *See—*
Iio, Toshimasa; and Ohkubo, Toyokazu, 4,374,098, Cl. 423-27.000.

Ohshima, Kiyoshi: *See—*
Kamiyama, Shin-ichi; Ohshima, Kiyoshi; Mochizuki, Manabu; Kato, Kazuyuki; and Saito, Takeshi, 4,373,800, Cl. 355-10.000.

Ohta, Tokuya: *See—*
Eida, Tsuyoshi; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Ohta, Tokuya, 4,373,954, Cl. 106-20.000.

Ohtsubo, Yoshiaki, to Nippon Kogaku K.K. Camera having a flashlight photography recommendation device. 4,373,790, Cl. 354-24.000.

Ohtsuka, Keizo: *See—*
Narato, Kiyoshi; Ohtsuka, Keizo; and Niwa, Sadahiko, 4,373,376, Cl. 73-23.100.

Okahashi, Keiji; Motoyama, Masanori; and Furukawa, Satoru, to Matsushita Electric Works, Ltd. Electrical multilayer contact. 4,374,311, Cl. 200-269.000.

O'Keefe, Patrick J., Jr.; and Weissler, Harold E., II, to Bendix Corporation, The. Automatic speed control for heavy vehicles. 4,374,422, Cl. 364-426.000.

Okubo, Kiyokazu, to Honda Giken Kogyo Kabushiki Kaisha. Clutch mechanism for power transmission system. 4,373,407, Cl. 74-650.000.

Okuyama, Hiroo, to Nissan Motor Company, Limited. Leg protector for passenger in vehicle. 4,373,746, Cl. 280-752.000.

Olashaw, William F.; and Postlethwait, James H., to General Electric Company. Insulating-isolating barrier system for electrical distribution equipment buswork. 4,374,405, Cl. 361-355.000.

Olesin, Andrew; Lake, Kevin K. L.; and Lee, Robert D., to Motorola, Inc. Switched capacitor precision current source. 4,374,357, Cl. 323-351.000.

Oliff, James R., to Mead Corporation, The. Wraparound article carrier with adjustable girth. 4,373,630, Cl. 206-434.000.

Olin Corporation: *See—*
Yarwood, John C.; Gaule, Gerhart K.; and Ungarean, Gary L., 4,373,571, Cl. 164-467.000.

Olivierse, Jan; and van Es, Machiel A. H., to Hoogovens IJmuiden B.V. Packing line for packing stacks of rectangular tinplate sheets on pallets. 4,373,320, Cl. 53-589.000.

Olsen, Alf J., to Xerox Corporation. Ribbon tension and metering control. 4,373,824, Cl. 400-234.000.

Olsen, Ronald H., to Microlife Technics, Inc. Broad host range small plasmid rings as cloning vehicles. 4,374,200, Cl. 435-172.000.

Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., to Snap-on Tools Corporation. Diesel engine timing apparatus. 4,373,384, Cl. 73-119.00A.

Olympia Werke AG: *See—*
Van Raamsdonk, Cornelis; and Wartusch, Johann, 4,374,223, Cl. 524-245.000.

Olympus Optical Company Ltd.: *See—*
Matsuura, Tsuyoshi; Fujiwara, Hiroshi; Aihara, Mamoru; Takahashi, Yutaka; and Nakajima, Yoshio, 4,373,796, Cl. 354-173.000.
Shimizu, Tokuo, 4,374,336, Cl. 310-154.000.
Takayama, Syuichi, 4,374,345, Cl. 315-241.00P.
Takekawa, Hiroshi, 4,373,931, Cl. 436-539.000.

Onda, Takanori; Kawasaki, Hiroshi; and Misawa, Mitsukuni, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission device of motorcycles. 4,373,601, Cl. 180-226.000.

Ono, Chikai: and Toyoda, Kazuhiro, to Fujitsu Limited. I^2L Semiconductor memory circuit device. 4,374,431, Cl. 365-174.000.

Ono, Tsuyoshi: *See—*
Ogawa, Hiroshi; Sato, Kazuhiro; Shibata, Norio; Oguri, Katsuhiko; Utida, Masayoshi; and Ono, Tsuyoshi, 4,374,433, Cl. 369-136.000.

Ootsuka, Ryotatsu: *See—*
Shingu, Hideo; Arai, Kozo; and Ootsuka, Ryotatsu, 4,373,950, Cl. 75-68.00R.

Opalka, Chester J., Jr.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,374,141, Cl. 424-266.000.

Opheij, Willem G.: *See—*
Van Rosmalen, Gerard E.; and Opheij, Willem G., 4,374,324, Cl. 250-201.000.

Optical Coating Laboratory, Inc.: *See—*
Thelen, Alfred J., 4,373,782, Cl. 350-166.000.

Orionov, Jury E.: *See—*
Anisimov, Veniamin M.; Belov, Valentin V.; Verkevich, Vsevolod I.; and Orionov, Jury E., 4,373,698, Cl. 251-26.000.

Orlando, Michael D.; and Riley, Jean M., to United States of America, Army. Process for coating a dry variola virus. 4,374,201, Cl. 435-239.000.

Osaka Municipal Government: *See*—
Hirashima, Tsuneaki; and Miyata, Toshiyuki, 4,374,250, Cl. 548-305.000.
Osawa, Yasuko; and Uchikuga, Saburo, to Sogo Pharmaceutical Co., Ltd. Process for preparing 2,2-disubstituted thiazolidines. 4,374,247, Cl. 548-146.000.
Oscar Lucks Company: *See*—
Allen, Beverly J., 4,373,430, Cl. 99-468.000.
Oshima, Mitsuaki; Neichi, Yutaka; Iga, Atsushi; and Wada, Ryoichi, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing system. 4,374,403, Cl. 360-113.000.
Ota, Naoto: *See*—
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,374,350, Cl. 518-590.000.
Otis Engineering Corporation: *See*—
Waters, Fleming A., 4,373,583, Cl. 166-113.000.
Ott, Granville E.: *See*—
Herrmann, Carlo L.; and Ott, Granville E., 4,374,395, Cl. 358-22.000.
Ouchi, Chiaki; and Kohsaka, Yohji, to Nippon Kokan Kabushiki Kaisha. Nonmagnetic steels having low thermal expansion coefficients and high yield points. 4,373,951, Cl. 75-123.00N.
Ousley, Russell M. Sundial. 4,373,270, Cl. 33-270.000.
Outboard Marine Corporation: *See*—
Billingsley, Henry C.; and DuBois, Chester G., 4,373,479, Cl. 123-187.50R.
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., 4,373,920, Cl. 440-59.000.
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., 4,373,921, Cl. 440-61.000.
Kirk, J. David, 4,373,475, Cl. 123-59.00B.
Owens-Illinois, Inc.: *See*—
Glick, Frederick J.; and Pedersen, Richard N., 4,373,944, Cl. 65-23.000.
Oyama, Shigeaki: *See*—
Kohzai, Yoshinori; Oyama, Shigeaki; and Koyama, Tatsuo, 4,374,337, Cl. 310-186.000.
Oyama, Yoshishige: *See*—
Nishimura, Yutaka; Kuroiwa, Hiroshi; Kirisawa, Tadashi; and Oyama, Yoshishige, 4,373,387, Cl. 73-204.000.
Pagani, Franco. Exercising device. 4,373,716, Cl. 272-137.000.
Page, Donald F.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,374,141, Cl. 424-266.000.
Page, John F.: *See*—
Wilson, Gregg; and Page, John F., 4,373,417, Cl. 84-1.160.
Pallotta, Frank, to DSH. Shelf assembly and bracket therefor. 4,373,448, Cl. 108-29.000.
Pallotta, Stefano. Retroreflectometer giving direct reading. 4,373,819, Cl. 356-445.000.
Palo Alto Medical Research Foundation: *See*—
Hill, Bruce C.; and Stern, Roger A., 4,373,532, Cl. 128-660.000.
Pandzik, Richard T., to General Motors Corporation. Variable capacity positive displacement type compressor. 4,373,870, Cl. 417-269.000.
Pano, Gury: *See*—
Consolazio, George A.; and Pano, Gury, 4,374,063, Cl. 260-118.000.
Papazian, Harry: *See*—
Canale, Ralph D.; Canale, Albert S.; and Papazian, Harry, 4,374,036, Cl. 252-135.000.
Papkov, Vladimir S.: *See*—
Beloglazov, Alexei V.; Beiden, Vladimir E.; Iordan, Georgy G.; Karneev, Vladimir M.; Papkov, Vladimir S.; Stuchebnikov, Vladimir M.; Khasikov, Viktor V.; and Surovikov, Mikhail V., 4,373,399, Cl. 73-777.000.
Papst, Georg F.; Harmsen, Siegfried; and Wrobel, Gunter, to Papst-Motoren KG. Axial-flow fan. 4,373,861, Cl. 415-213.00C.
Papst Motoren KG: *See*—
Muller, Rolf, 4,374,347, Cl. 318-138.000.
Papst, Georg F.; Harmsen, Siegfried; and Wrobel, Gunter, 4,373,861, Cl. 415-213.00C.
Paradyne Corporation: *See*—
Armstrong, Thomas R., 4,374,436, Cl. 371-11.000.
Parent, Edward D., to GTE Products Corporation. Intermetallic composite. 4,373,952, Cl. 75-244.000.
Park, John N.: *See*—
Steigerwald, Robert L.; and Park, John N., 4,374,355, Cl. 320-43.000.
Parker, John L., Jr.; and Ranes, Robert B., to Western Electric Company, Inc. Method of preserving the solderability of copper. 4,373,656, Cl. 228-203.000.
Parker, William R.; and Gosche, Matt J., to Union Special Corporation. Sewing machine loopers. 4,373,460, Cl. 112-162.000.
Parnum, John D.; and Barber, Nigel T., to Newall Engineering Company Limited, The. Cam machining. 4,373,301, Cl. 51-281.00C.
Parsons, Charles F., Jr. Wheel suspension system for vehicles. 4,373,743, Cl. 280-661.000.
Parsons, Ronald S. Double-walled rotary tubular conveyor with stabilizing drive means. 4,373,625, Cl. 198-804.000.
Partridge, Lyle D. Apparatus for collecting particles produced during abrading of precious metals. 4,373,300, Cl. 51-270.000.
Pascuzzi, E. Anthony: *See*—
Cornell, William F.; Vear, John P.; and Pascuzzi, E. Anthony, 4,373,659, Cl. 229-32.000.
Pastor, Stephen D.: *See*—
Spivack, John D.; Dexter, Martin; and Pastor, Stephen D., 4,374,219, Cl. 524-91.000.
Pastorius, W. J.: *See*—
Pryor, Timothy R.; Hockley, Bernard; Liptay-Wagner, Nick; Hageniers, Omer L.; and Pastorius, W. J., 4,373,804, Cl. 356-1.000.
Patient Technology, Inc.: *See*—
Peppel, George W., 4,373,894, Cl. 425-393.000.
Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Bonding devices and methods for bonding tape closures to a container end. 4,373,978, Cl. 156-69.000.
Pauly, Peter D.: *See*—
Stone, Herman; Pauly, Peter D.; and Pcolinsky, Michael P., Jr., 4,374,207, Cl. 521-107.000.
Pcolinsky, Michael P., Jr.: *See*—
Stone, Herman; Pauly, Peter D.; and Pcolinsky, Michael P., Jr., 4,374,207, Cl. 521-107.000.
Pearch, Dean A.; and Pung, Thomas F., Sr., to Dana Corporation. Torque limiting mechanism. 4,373,358, Cl. 464-48.000.
Pearl, David R.: *See*—
Gerber, Heinz J.; and Pearl, David R., 4,373,412, Cl. 83-24.000.
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Pelton, John F., to Union Carbide Corporation. Apparatus for refining molten metal. 4,373,704, Cl. 266-225.000.
Pelura, Carme D., to Neat Nap, Inc. Dual character doll. 4,373,292, Cl. 46-153.000.
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Pullen, Geoffrey J.; Pemberton, John A.; and Brown, Colin J., 4,373,319, Cl. 53-573.000.
Penelizer Corporation: *See*—
Stone, Eugene M., 4,373,961, Cl. 106-281.00R.
Peng, C. S. Patrick: *See*—
Howell, John R.; and Peng, C. S. Patrick, 4,373,347, Cl. 62-112.000.
Pennertz, Donald W.; and Burkey, Ritchie J., to Alexandria Extrusion Company. Deburring machine. 4,373,297, Cl. 51-84.00R.
Pennwalt Corporation: *See*—
Wright, Danny W., 4,373,942, Cl. 62-12.000.
Peppel, George W., to Patient Technology, Inc. Method and apparatus for making plastic tubes. 4,373,894, Cl. 425-393.000.
Pera, John D.: *See*—
Fenyes, Joseph G. E.; and Pera, John D., 4,374,040, Cl. 252-389.00A.
Perineau, Philippe; and Lebreton, Yves, to Vallourec. Device for rapidly cooling metal tubes. 4,373,703, Cl. 266-131.000.
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Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,374,413, Cl. 364-200.000.
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Petersen, Ross K., to Medalie Manufacturing Co. Air precleaner for internal combustion engine. 4,373,940, Cl. 55-328.000.
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Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,374,244, Cl. 542-476.000.
Petrovic, John E.; and Trenary, John, to Teledyne Industries, Inc. Rechargeable electric portable appliance. 4,374,354, Cl. 320-2.000.
Pfister, Johann K., to Schweizerische Lokomotiv und Maschinenfabrik. Rail vehicle passenger body. 4,373,447, Cl. 105-399.000.
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Belletire, John L., 4,374,148, Cl. 424-317.000.
Scorey, Clive R.; and Smith, Roy A., 4,373,970, Cl. 148-11.50C.
Phaal, Cornelius; and Jurgens, Rainer, to Christensen, Inc. Drill bit. 4,373,593, Cl. 175-329.000.
Phelps, Weldon L., to Caterpillar Tractor Co. Pulse width modulated constant current servo driver. 4,373,697, Cl. 251-129.000.
Philion, Richard E., to Sterling Drug Inc. α-{[(Arylalkyl)amino]alkyl}-4-hydroxy-3-(lower-alkylsulfinyl)benzenemethanols. 4,374,149, Cl. 424-330.000.
Phillips, Albert. Fluid actuated pump system. 4,373,874, Cl. 417-397.000.

Phillips, Arthur P., to Burroughs Wellcome Co. Topical inflammatory pharmaceutical formulations. 4,374,146, Cl. 424-282.000.
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MacEwen, George E., 4,373,646, Cl. 222-327.000.
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Picavet, Rudolf P. Alternating rotor motor with spring clutches. 4,373,879, Cl. 418-35.000.
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Piesik, Edward T., to General Dynamics, Pomona Division. Combustion suppressor. 4,373,420, Cl. 89-1.812.
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Pillifant, Harold E., Jr. Vehicle warning device. 4,374,376, Cl. 340-84.000.
Piotrowski, Tadeusz W., to Cincinnati Milacron Inc. Full access pallet shuttle guarding. 4,373,406, Cl. 74-613.000.
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Piscitelli, R. Amelia; Hemmer, Valentine J.; Fischer, Charles P.; and Shepler, Eric F., to Bendix Corporation, The. Socket type contact assembly. 4,373,773, Cl. 339-262.00R.
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Schoenfelder, George A.; Rork, Gerald D.; and Hiltenbrand, Richard E., 4,374,329, Cl. 250-574.000.
Planeta, Mirek, to Workman Bag Company Ltd. Sealed bags of plastic materials. 4,373,979, Cl. 156-73.100.
Plapp, Gunther; and Romann, Peter, to Robert Bosch GmbH. Device for burnoff of a measuring resistor. 4,373,383, Cl. 73-118.000.
Plasticisers, Ltd.: *See*—
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Larkins, Thomas H.; Polichnowski, Stanley W.; Tustin, Gerald C.; and Young, David A., 4,374,070, Cl. 260-549.000.
Politechnika Slaska im. Wincentego Pstrowskiego: *See*—
Skalmierski, Bogdan; and Mroz, Krzysztof, 4,373,980, Cl. 156-160.000.
Polk, Darryl R.; and Williams, Errol R., Jr., to International Business Machines Corporation. Capacitive transducer for sensing a home position. 4,374,383, Cl. 340-870.370.
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Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.
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Ponto, Robert; and Martin, Hardison G., to Innovative Electronics, Inc. Sound mixer devices. 4,374,300, Cl. 179-1.0AT.
Popovski, George N.; and Vizmuller, Peter, to Motorola, Inc. Helical resonator filter. 4,374,370, Cl. 333-202.000.
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Post, Larry K.: *See*—
Culbertson, Billy M.; Post, Larry K.; and Aulabaugh, Ann E., 4,374,235, Cl. 526-262.000.
Postler, Daniel P.: *See*—
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Powers, Joseph; Trocciola, John C.; and Martin, Ronald G., to United Technologies Corporation. High temperature, high pressure chemical resistant seal material. 4,374,185, Cl. 429-36.000.
Poznick, Jeffrey B.: *See*—
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PPG Industries, Inc.: *See*—
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Hsu, Ed C.; Moore, L. Dow; and Temple, Chester S., 4,374,177, Cl. 428-392.000.
Precision Monolithics, Inc.: *See*—
Fukahori, Kiyoshi; and Nishikawa, Yukio, 4,374,335, Cl. 307-521.000.
Precitronic Gesellschaft fur Feinmechanik und Electronic m.b.H.: *See*—
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Prendergast, James P. Safety stirrup. 4,373,321, Cl. 54-49.000.
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Grout, Kenneth M.; and Presby, David W., 4,373,285, Cl. 42-90.000.
Previti, Frank R. Balanced impedance coupler. 4,374,363, Cl. 330-263.000.
Primack, Harold S., to Air Resources, Inc. Composition and method for removing hydrogen sulfide from gas stream. 4,374,104, Cl. 423-226.000.
Pringle, Ronald E., to Camco, Incorporated. Fluid displacement well safety valve. 4,373,587, Cl. 166-324.000.
Prismo Universal Limited: *See*—
Kilner, David N., 4,373,670, Cl. 239-172.000.
Procter & Gamble Company, The: *See*—
Bossu, Frank P., 4,374,035, Cl. 252-91.000.
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Elhaus, Friedrich W.; and Hilge, Bernhard, 4,373,706, Cl. 266-252.000.
Pryor, Timothy R.; Hockley, Bernard; Liptay-Wagner, Nick; Hageniers, Omer L.; and Pastorius, W. J., to Diffracto Ltd. Method and apparatus for electro-optically determining the dimension, location and attitude of objects. 4,373,804, Cl. 356-1.000.
Przytarski, Joachim, to KTS, Kunstoff-Technische Spezialfertigungen Anni Przytarski. Transport container. 4,373,643, Cl. 220-450.000.
Ptaschek, Werner: *See*—
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Pullen, Geoffrey J.; Pemberton, John A.; and Brown, Colin J., to EMI Limited. Record bagging. 4,373,319, Cl. 53-573.000.
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Rao, Manjeshwar S.: *See*—
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Raux, Jacques; and Benoist, Jacques, to Souriau & Cie. Electrical connector with tactile locking telltale. 4,373,770, Cl. 339-113.00R.
Ray, Lynn L. Racket stringer tensioner. 4,373,721, Cl. 273-73.00A.

Ray, Siba P., to Aluminum Company of America. Inert electrode compositions. 4,374,050, Cl. 252-519.000.

Raychem Corporation: *See*—
Clarke, Raymond, 4,373,768, Cl. 350-96.340.
Cook, Paul M., 4,373,554, Cl. 138-137.000.
Doucet, Jos, 4,374,231, Cl. 525-179.000.
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RCA Corporation: *See*—
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Blumenfeld, Martin A., 4,373,254, Cl. 29-578.000.
Camisa, Raymond L., 4,374,394, Cl. 357-81.000.
Chang, Kern K. N., 4,374,343, Cl. 313-422.000.
Crowley, Albert T., 4,374,438, Cl. 455-265.000.
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Reichert, Walter F., 4,374,392, Cl. 357-23.000.
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Re, Ronald, to Miletech, Inc. Fuel control system. 4,373,502, Cl. 123-512.000.

Rech, Jacques, to Allibert Exploitation. Coupling formation for the interfitting of structural elements. 4,373,306, Cl. 52-98.000.

Reed, Robert D.; and Schwartz, Robert F., to John Zink Company. Immediate ignition smokeless burning of waste gases. 4,373,902, Cl. 431-202.000.

Regehr, Ulrich. Counterflow cooling tower. 4,374,071, Cl. 261-109.000.

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Reid, Taylor A.; Miller, James A.; and Barber, Duane G., to Beckman Instruments, Inc. Control of system energy in a single beam spectrophotometer. 4,373,813, Cl. 356-326.000.

Reiss, Edward H., Jr., to United States of America, Army. Gas generators having controlled operational attitudes. 4,374,091, Cl. 422-114.000.

Reitter, Guenther W. Rotary impact crusher having a continuous rotary circumference. 4,373,678, Cl. 241-189.00R.

Reliability, Inc.: *See*—
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Renzel, Peter; and Vermohlen, Werner, to Krautkramer-Branson Incorporated. Ultrasonic test apparatus and sweep voltage generator for use therein. 4,373,394, Cl. 73-606.000.

Resele, Peter; and Haslinger, Manfred, to Steyr-Daimler-Puch Aktiengesellschaft. Front fork and fork head for motorcycles. 4,373,741, Cl. 280-279.000.

Resio, George F. Medicine bottle accessory. 4,373,640, Cl. 215-228.000.

Respitrace Corporation: *See*—
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Richardson, John K. D. Method of forming floor drainage trough installation. 4,374,078, Cl. 264-35.000.

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Kamiyama, Shin-ichi; Ohshima, Kiyoshi; Mochizuki, Manabu; Kato, Kazuyuki; and Saitô, Takeshi, 4,373,800, Cl. 355-10.000.
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Rite-Hite Corporation: *See*—
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Ritter, Friedhelm A., to Raychem GmbH. Plug connection for ribbon cables. 4,373,765, Cl. 339-75.0MP.

RM Industrial Products Company, Inc.: *See*—
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Knapp, Heinrich, 4,373,491, Cl. 123-472.000.
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Roberts, Lorraine J. Optical apparatus for applying make-up. 4,373,789, Cl. 351-158.000.

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Shopsky, Harvey J., 4,374,338, Cl. 313-142.000.

Robinson, Jimmie R., to Flint & Walling, Inc. Refuse container lift pocket. 4,373,849, Cl. 414-408.000.

Robison, Thomas E. Reaction gill net. 4,373,286, Cl. 43-10.000.

Roccaforte, Harry I., to Champion International Corporation. Carton for carded product. 4,373,626, Cl. 206-45.140.

Rockwell International Corporation: *See*—
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Heinz, Theodore A., 4,373,404, Cl. 74-424.80B.
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Rodenbaugh, Ralph L.; and Zwigert, John M., to Deco Coatings Corporation; and Carl Strutz & Company, Inc. Apparatus to supply articles for printing. 4,373,437, Cl. 101-35.000.

Roderick, John J.: *See*—
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Rolen, Jack L.: *See*—
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Rollmann, Louis D.; and Valyocsik, Ernest W., to Mobil Oil Corporation. Continuous-stream upflow zeolite crystallization apparatus. 4,374,093, Cl. 422-202.000.

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Meetham, Geoffrey W.; and Gray, John D., 4,374,084, Cl. 420-449.000.
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Roman, Steven A., to Shell Oil Company. Ketoenamine pyrethroid intermediates. 4,374,275, Cl. 568-351.000.

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Roper, Charles R., Jr.; Strattan, John K.; Hetherington, Roy, Jr.; and Hiller, Austin J., to Lukens, Inc. Process for making resulfurized machinable steel. 4,373,967, Cl. 148-2.000.

Rork, Gerald D.: *See*—
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Rost, Helmut: *See*—
Borburgh, Jacques; Naefe, Gerhard; and Rost, Helmut, 4,373,395, Cl. 73-607.000.

Rothwarf, Frederick, to United States of America, Army. Method of making a composite wire. 4,373,977, Cl. 156-51.000.

Rothwell, Geoffrey R., to Imperial Chemical Industries Limited. Aqueous dispersions of coloring materials: poly-alkyleneoxy naphthalene dispersing agents. 4,373,930, Cl. 8-527.000.

Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,374,257, Cl. 549-302.000.

Rowlands, Jeffrey P., to Interchem International S.A. Polymer-modified polyols useful in polyurethane manufacture. 4,374,209, Cl. 521-116.000.

Roy M. Moffitt Company, The: *See*—
Edwards, Robert E.; McKee, Donald H.; and Brown, Claude D., 4,373,363, Cl. 69-28.000.

RSR Corporation: *See*—
Prengaman, Raymond D.; and Howard, James L., 4,373,654, Cl. 228-173.00R.

RTE Corporation: *See*—
Lorenzen, John H.; and Majewski, John V., 4,373,772, Cl. 339-130.00R.

Ruan, Incorporated: *See*—
Giles, William L., 4,373,857, Cl. 414-786.000.

Ruel, Jacques: *See*—
Schapira, Joseph; Ruel, Jacques; Cheminaud, Jean C.; Sadlo, Robert; and Christian, Robert, 4,374,039, Cl. 252-384.000.

Runkle, Dean E., to Bendix Corporation, The. Disc brake assembly. 4,373,614, Cl. 188-72.300.

Russell, Leslie T., to Canadian Patents & Development Limited. Arch forming structure. 4,373,305, Cl. 52-86.000.

Russell, William K.: *See*—
Mason, William L.; and Russell, William K., 4,373,863, Cl. 417-12.000.

Rust, Werner F.: *See*—
Vora, Madhukar B.; and Rust, Werner F., 4,374,011, Cl. 204-192.0EC.

Ruszala, Ferdinand A.; Hoggins, James T.; and Hupp, Stephen S., to Ashland Oil, Inc. Manufacture of phosphosiderite iron phosphate. 4,374,109, Cl. 423-311.000.

Ruszala, Ferdinand A., to Ashland Oil, Inc. Oxydehydrogenation process for preparing methacrylic acid and its lower alkyl esters. 4,374,269, Cl. 562-599.000.

Ruszala, Ferdinand A.; and Weeks, Thomas J., Jr., to Ashland Oil, Inc. Oxydehydrogenation process for preparing methacrylic acid and its lower alkyl esters. 4,374,270, Cl. 562-599.000.

Rutkiewicz, John: *See*—
Pitetti, Raymond C.; and Rutkiewicz, John, 4,374,159, Cl. 427-96.000.

Rutnarak, Sangvorn: *See*—
Mowles, Donald L.; Middaugh, James F.; Rutnarak, Sangvorn; and Genese, Joseph N., 4,373,559, Cl. 141-18.000.

Sabel, Gustav, to Ford Motor Company. Reverse speed shift device for a motor vehicle change-speed gearbox. 4,373,618, Cl. 192-4.00B.

Sadlo, Robert: *See*—
Schapira, Joseph; Ruel, Jacques; Cheminaud, Jean C.; Sadlo, Robert; and Christian, Robert, 4,374,039, Cl. 252-384.000.

Saga, Hitoshi: *See*—
Toda, Haruhiko; Higo, Moriaki; Saga, Hitoshi; and Shinbo, Masafu, 4,374,292, Cl. 585-360.000.

Sagal, John, Jr.: *See*—
Henry, Arnold W.; Azar, Jack C.; and Sagal, John, Jr., 4,373,239, Cl. 29-132.000.

Sage Manufacturing Co., Inc.: *See*—
Fera, Victor, 4,373,236, Cl. 29-3.000.

Saito, Hiroshi: *See*—
Saito, Nobuyuki; and Saito, Hiroshi, 4,374,377, Cl. 340-384.00E.
Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, 4,374,284, Cl. 568-817.000.

Saito, Nobuyuki; and Saito, Hiroshi, to Sumitomo Electric Industries, Ltd. Piezoelectric audio transducer. 4,374,377, Cl. 340-384.00E.

Saito, Takeshi: *See*—
Kamiyama, Shin-ichi; Ohshima, Kiyoshi; Mochizuki, Manabu; Kato, Kazuyuki; and Saito, Takeshi, 4,373,800, Cl. 355-10.000.

Sakai, Toshihiro; and Kuhara, Tetsuji, to Fujitsu Limited; and USAC Electronic Industrial Co., Ltd. Data processing system. 4,374,410, Cl. 364-200.000.

Sakamoto, Yukio; Tanaka, Tetsuo; Kuboto, Masaaki; and Sugitani, Masami, to Murata Manufacturing Co., Ltd. Electromagnetic interference elimination filter. 4,374,369, Cl. 333-182.000.

Salama, Amir, to Northern Telecom Limited. Method and apparatus for surface-treating predetermined areas of a surface of a body. 4,374,004, Cl. 204-15.000.

Salvajor Company: *See*—
Sherman, George O., Jr., 4,373,676, Cl. 241-36.000.

Salzer, Thomas E.; and Masheff, Michael S., to Raytheon Company. Method and apparatus for ultrasonic bonding. 4,373,653, Cl. 228-104.000.

Samson, Marc: *See*—
Kleemann, Axel; Martens, Jurgen; and Samson, Marc, 4,374,062, Cl. 260-112.50R.

Sanders, James M.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Josquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,374,054, Cl. 252-522.00R.

Sandoz, Inc.: *See*—
Barcza, Sandor, 4,374,130, Cl. 424-184.000.

Sandoz Ltd.: *See*—
Wicki, Heinz, 4,374,064, Cl. 260-147.000.

Sano, Ichiro, to Furukawa Battery Co., Ltd., The. Cover apparatus in monoblock storage battery. 4,374,187, Cl. 429-175.000.

Sano, Yasuro, to Janome Sewing Machine Co. Ltd. Sewing machine with a cycle pattern stitching device. 4,373,461, Cl. 112-274.000.

Santiago, Andres; and Santiago, Enrique, to Zeuna-Staerker GmbH & Co. KG. Manifold on an internal combustion engine. 4,373,331, Cl. 60-323.000.

Santiago, Enrique: *See*—
Santiago, Andres; and Santiago, Enrique, 4,373,331, Cl. 60-323.000.

Santrade Ltd.: *See*—
Kanakaris, Georges, 4,373,411, Cl. 82-44.000.

Saperstein, Zalman P.; El-Bourini, Refki M.; and Munch, John E., Jr., to Modine Manufacturing Company. Radiator with heat exchanger. 4,373,578, Cl. 165-141.000.

Sartori, Francesco. Device for rigidly coupling a handle to its corresponding manual instrument, and an instrument provided with the said device. 4,373,828, Cl. 403-263.000.

Sasaki, Katumasa: *See*—
Uenishi, Toshiaki; Harada, Hidefumi; Sasaki, Katumasa; Akagi, Akio; and Yamasaki, Takanori, 4,373,963, Cl. 106-304.000.

Sasaya, Hideaki: *See*—
Tanaka, Taro; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,373,880, Cl. 418-150.000.

Sato, Akio: *See*—
Hirakawa, Hiroshi; Sato, Akio; Takunagawa, Takashi; and Ikeda, Nobumasa, 4,373,566, Cl. 152-353.00G.

Sato, Akira: *See*—
Morishita, Tera; Sugiyama, Matuyosi; Sato, Akira; and Suzuki, Toshikazu, 4,373,673, Cl. 239-703.000.

Sato, Kazuhiro: *See*—
Ogawa, Hiroshi; Sato, Kazuhiro; Shibata, Norio; Oguri, Katsuhiko; Utida, Masayoshi; and Ono, Tsuyoshi, 4,374,433, Cl. 369-136.000.

Sato Technical Research Laboratory Ltd.: *See*—
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,374,074, Cl. 264-8.000.

Satoh, Nobuo: *See*—
Takizawa, Junichi; and Satoh, Nobuo, 4,373,747, Cl. 280-802.000.

Saunders Archery Co.: *See*—
Saunders, Charles A., 4,373,503, Cl. 124-20.00R.

Saunders, Charles A., to Saunders Archery Co. Slingshot with outer sleeve for elastic band protection. 4,373,503, Cl. 124-20.00R.

Sauvaget, Gaston. Synchronized hydraulic rotary converter and distributor device. 4,373,878, Cl. 418-23.000.

Sawatani, Tadashi; Ishii, Mitsuo; and Yoshimura, Hirofumi, to Nippon Steel Corporation. Process for the production of ferritic stainless steel sheets or strips and products produced by said process. 4,373,971, Cl. 148-12.0EA.

Sawyer, George N., to Trane CAC, Inc. Combination discharge gas muffler and water heater. 4,373,354, Cl. 62-238.600.

Say, Donald L., to North American Philips Consumer Electronics Corp. Beam focusing means in a unitized tri-potential CRT electron gun assembly. 4,374,341, Cl. 313-414.000.

Say, Donald L., to North American Philips Consumer Electronics Corp. Focusing means in a unitized bi-potential CRT electron gun assembly. 4,374,342, Cl. 313-414.000.

Scaramucci, Domer. Fire safe disc valve. 4,373,542, Cl. 137-72.000.

Scartazzini, Riccardo: *See*—
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,374,134, Cl. 424-246.000.

Schaaf, Wayne J.; and Boswell, Bennie J., to Chromalloy American Corporation. Implement and last motion hitch locking mechanism therefor. 4,373,591, Cl. 172-328.000.

Schachar, Ronald A. Variable power intraocular lens and method of implanting into the posterior chamber. 4,373,218, Cl. 3-13.000.

Schaefer, Carl F.; and Bedford, Raymond E., to General Motors Corporation. Cordierite bead catalyst support and method of preparation. 4,374,044, Cl. 252-455.00R.

Schaefer, William J. Automobile body repair. 4,373,373, Cl. 72-413.000.

Schafer, Otmar U. Method and apparatus for alternately heating and cooling a heat exchanger. 4,373,574, Cl. 165-2.000.

Schaffner, Mario R. Circulating page loose system. 4,374,412, Cl. 364-200.000.

Schapira, Joseph; Ruel, Jacques; Cheminaud, Jean C.; Sadlo, Robert; and Christian, Robert, to Compagnie Francaise de Produits Industriels. Anticlumping products and treatments based on amin salts. 4,374,039, Cl. 252-384.000.

Schapper, Mark A., to Sphere Investments Limited. Sorting apparatus. 4,373,638, Cl. 209-570.000.

Schepers, Bernhard; Nobbe, Volker; Schroder, Bernd; Borer, Werner; and Kullack, Manfred, to Swiss Aluminium Ltd. Process for the production of coarse crystalline alumina. 4,374,119, Cl. 423-625.000.

Schey, John A., to Modine Manufacturing Company. Method of forming integral flanges in a sheet. 4,373,369, Cl. 72-347.000.

Schiller, Gottfried: *See*—
Greiner, Max; Krieger, Klaus; Schiller, Gottfried; Walk, Wolf-Rudiger; and Walz, Ludwig, 4,373,496, Cl. 123-569.000.

Schillinger, Rainer: *See*—
Kemmner, Ulrich; Ringwald, Peter; Mutschele, Hans-Ulrich; and Schillinger, Rainer, 4,373,872, Cl. 417-312.000.

Schindler, Manfred; Ficht, Reinhold; and Vogt, Hermann, to Ficht GmbH. Scavenging arrangement for a two-stroke internal combustion piston engine. 4,373,474, Cl. 123-56.00B.

Schlafer, John, to GTE Laboratories Incorporated. Acoustic to optical pulse code modulating transducer. 4,373,781, Cl. 350-96.290.

Schmidt, Donald H. Flexible cork handle-wrapping strip. 4,373,718, Cl. 273-75.000.

Schmidt, Frederick R.: *See*—
Ng, Henry H.; and Schmidt, Frederick R., 4,374,381, Cl. 340-711.000.

Schmidt, Laurenz: *See*—
Bauser, Elisabeth; Frik, Martina; Lochner, Karl S.; and Schmidt, Laurenz, 4,373,988, Cl. 156-622.000.

Schmidt, Peter: *See*—
Herberholz, Klaus; and Schmidt, Peter, 4,373,755, Cl. 294-67.00R.

Schmidt, Robert J., to UOP Inc. Hydration of olefins. 4,374,286, Cl. 568-907.000.

Schmitt, Frederick L.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,374,054, Cl. 252-522.00R.
Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,374,055, Cl. 252-522.00R.

Schneider, Peter: *See*—
Kocsis, Karoly; Schneider, Peter; Fechtig, Bruno; and Scartazzini, Riccardo, 4,374,134, Cl. 424-246.000.

Schnell, Ludwig L., to Schuttgutfordertechnik AG. Device for conveying a slurry, such as sand or gravel or the like, lying under water. 4,373,276, Cl. 37-61.000.

Schober, Karl; and Groll, Fritz, to Daimler-Benz Aktiengeseilschaft. Exhaust adapter for exhaust gas measurements. 4,373,751, Cl. 285-137.00R.

Schoenfelder, George A.; Rork, Gerald D.; and Hiltenbrand, Richard E., to Pittway Corporation. Smoke detector with test apparatus. 4,374,329, Cl. 250-574.000.

Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Alkyl esters of 1-alkanoyl cycloalkanols and organoleptic uses thereof. 4,374,055, Cl. 252-522.00R.

Schreiber, William L.: *See*—
Schreck, Ronald P.; Light, Kenneth K.; Hall, John B.; Schmitt, Frederick L.; Vock, Manfred H.; Schreiber, William L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,374,055, Cl. 252-522.00R.

Schreier, Josef: *See*—
Gehle, Karl; and Schreier, Josef, 4,373,757, Cl. 299-43.000.

Schreiner, Charles P.: *See*—
Wolters, Richard H.; Anderson, William C.; Tyke, Charles R.; and Schreiner, Charles P., 4,373,642, Cl. 220-72.000.

Schritt, Renaldo F.; and Kenney, Martin J., to Grad-Line, Inc. Transmission control system. 4,373,619, Cl. 192-0.090.

Schroder, Bernd: *See*—
Schepers, Bernhard; Nobbe, Volker; Schroder, Bernd; Borer, Werner; and Kullack, Manfred, 4,374,119, Cl. 423-625.000.

Schroeder, Jon M., to Indy Electronics, Inc. Method and apparatus for encapsulation casting. 4,374,080, Cl. 264-102.000.

Schuddemat, Jacob P.; and Huijsing, Johan H., to Brooks Instrument B.V. Direction sensitive flow velocity meter and sensing plate to be used on it. 4,373,386, Cl. 73-189.000.

Schuhmacher, Ernst, to Deere & Company. Torque limiting clutch. 4,373,924, Cl. 464-38.000.

Schulmeyer, Lutz: *See*—
Fricke, Hans; Kiess, Jurgen; and Schulmeyer, Lutz, 4,373,691, Cl. 246-34.0CT.

Schultheis, Hans-Werner, to Hubtex Maschinenbau GmbH. Warp beam insertion carriage. 4,373,854, Cl. 414-742.000.

Schulz, Claus: *See*—
Kundler, Walter; Pientak, Reinhold; Schulz, Claus; and Skerka, Wolfgang, 4,374,423, Cl. 364-434.000.

Schumacher, Jerome A.: *See*—
Neitzel, Emery W.; and Schumacher, Jerome A., 4,373,509, Cl. 126-299.00D.

Schuttgutfordertechnik AG: *See*—
Schnell, Ludwig L., 4,373,276, Cl. 37-61.000.

Schwab Safe Co., Inc.: *See*—
Miller, Norman; and McKinnis, John F., Jr., 4,373,450, Cl. 109-75.000.

Schwartz, Larry A.; Geiter, Robert; and Albertsen, Peter S., to Jamestown Group. Stove construction. 4,373,507, Cl. 126-289.000.

Schwartz, Robert E.: *See*—
Reed, Robert D.; and Schwartz, Robert E., 4,373,902, Cl. 431-202.000.

Schwarz, Herwig. J.; Burde, Hans-Jurgen H.; and Minet, Gunter, to Teroson GmbH. Sound insulating material. 4,374,172, Cl. 428-308.400.

Schweizerische Lokomotiv und Maschinenfabrik: *See*—
Pfister, Johann K., 4,373,447, Cl. 105-399.000.

Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Viscous material pump, in particular for the conveyance of concrete. 4,373,875, Cl. 417-517.000.

Schwing, Friedrich: *See*—
v.Eckardstein, Karl-Ernst; Fiala, Werner; and Schwing, Friedrich, 4,373,225, Cl. 15-104.06A.

SCM Corporation: *See*—
Andonian, Harry A.; and Dickinson, Warren A., Jr., 4,374,153, Cl. 426-321.000.

Scorey, Clive R.; and Smith, Roy A., to Pfizer Inc. Copper base spinodal alloy strip and process for its preparation. 4,373,970, Cl. 148-11.50C.

Scott & Fetzer Company, The: *See*—
Kaplan, Robert A.; Reicke, Mark A.; and Wellman, James E., 4,373,901, Cl. 431-186.000.

Scragg, Robert L. Electromagnetic process and apparatus for making methanol. 4,374,288, Cl. 568-910.000.

Seabaugh, Alan C.: *See*—
United States of America, National Aeronautics and Space Administration; Mattauch, Robert J.; and Seabaugh, Alan C., 4,373,989, Cl. 156-635.000.

Sebastian, James A. Device for displaying indicia. 4,373,281, Cl. 40-491.000.

Sebenik, Roger F.; Hallada, Calvin J.; Barry, Henry F.; and Tsigdinos, George A., to Amax Inc. Recovery and recycle of molybdenum values from coal liquefaction residue. 4,374,100, Cl. 423-56.000.

Sekiguchi, Toshio, to Hokushin Elect. Works, Ltd. Signal generator for electromagnetic flowmeters. 4,373,400, Cl. 73-861.120.

Selsted, Walter T. Pool water level maintenance apparatus and method. 4,373,220, Cl. 4-508.000.

Selusnik, Jerome A.: *See*—
Wright, Norbert L.; and Selusnik, Jerome A., 4,373,648, Cl. 223-28.000.

Sepponen, Raimo E. NMR Diagnosis apparatus. 4,374,360, Cl. 324-309.000.

Seton Company: *See*—
Cioca, Gheorghe, 4,374,121, Cl. 424-19.000.

Severeid, David E.; and Jech, Daryl D., to International Telephone and Telegraph Corporation. Process for the secondary treatment of wastewater. 4,374,027, Cl. 210-608.000.

Shaffer, John W.: *See*—
Hall, Harold H., Jr.; Bouchard, Andre C.; Shaffer, John W.; and Gavenonis, Thomas L., 4,374,073, Cl. 264-3.00R.

Shah, Hasmukh: *See*—
Ulin, Roy A.; Foley, Ted; and Shah, Hasmukh, 4,373,629, Cl. 206-350.000.

Shang, Jerry Y.: *See*—
Pitrolo, Augustine A.; Mei, Joseph S.; and Shang, Jerry Y., 4,373,454, Cl. 110-347.000.

Shanoski, Henry, to General Tire & Rubber Company, The. One component in-mold coating composition comprising a composition having a plurality of polymerizable ethylenic double bonds and a material containing isocyanate. 4,374,238, Cl. 528-50.000.

Sharnoa Ltd.: *See*—
Hagiz, Yitzchak, 4,373,589, Cl. 171-31.000.

Sharp, Brian W.: *See*—
Hill, Jack; Sharp, Brian W.; Warburton, Dennis; Walker, Robert B., deceased; and Walker, Thomas, administrator, 4,374,136, Cl. 424-251.000.

Sharp Kabushiki Kaisha: *See*—
Itoh, Fukusaburo, 4,373,801, Cl. 355-14.0FU.
Nonomura, Keisaku; Takamatsu, Toshiaki; Uede, Hisashi; and Wada, Tomio, 4,373,784, Cl. 350-336.000.

Shekel, Joseph; and DeStefano, Joseph, to Auto-Line Manufacturing Corp. Auxiliary connector including flip adapter. 4,373,762, Cl. 339-31.00B.

Shekel, Joseph; and DeStefano, Joseph, to Auto-Line Manufacturing Corp. Auxiliary connector including flip adapter. 4,373,763, Cl. 339-31.00B.

Shekleton, Jack R., to International Harvester Company. Combustors. 4,373,325, Cl. 60-39.060.

Shell Oil Company: *See*—
Ayers, Ray R.; and Kipp, Robert M., 4,373,753, Cl. 285-319.000.
Geis, William A.; and Frimodig, Carl H., Jr., 4,373,547, Cl. 137-377.000.
Roman, Steven A., 4,374,275, Cl. 568-351.000.
Trevino, Cesar A.; and Stellman, Richard G., 4,374,020, Cl. 208-216.00R.

Shenoha, James L., to Norwood Marking & Equipment Co., Inc. Axially aligned driving cam imprinter. 4,373,436, Cl. 101-27.000.

Shepherd, Kenneth D.: *See*—
Brown, Robert J.; and Shepherd, Kenneth D., 4,373,543, Cl. 137-74.000.

Shepler, Eric F.: *See*—
Piscitelli, R. Amelia; Hemmer, Valentine J.; Fischer, Charles P.; and Shepler, Eric F., 4,373,773, Cl. 339-262.00R.

Sheppard, Darrel J., Sr. Gearless hydraulic transmission and vehicle drive system. 4,373,605, Cl. 180-308.000.

Sherman, George O., Jr., to Salvajor Company. Waste food disposal system. 4,373,676, Cl. 241-36.000.

Sherritt Gordon Mines Limited: *See*—
Adamovic, Emilija, 4,374,173, Cl. 428-325.000.

Shibata, Norio: *See*—
Ogawa, Hiroshi; Sato, Kazuhiro; Shibata, Norio; Oguri, Katsuhiko; Utida, Masayoshi; and Ono, Tsuyoshi, 4,374,433, Cl. 369-136.000.

Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, to Minophagen Pharmaceutical Company. Antiulcer, antiinflammatory, and antiallergic agent comprising as the main ingredient olean-12-ene-3β, 30-diol which is devoid of side effects of glycyrrhetinic acid and a new process for preparation of olean-12-ene-3β, 30-diol. 4,374,284, Cl. 568-817.000.

Shields, R. James: *See*—
Connelly, Lawrence J.; Kane, James; and Shields, R. James, 4,374,102, Cl. 423-206.00T.

Shikata, Mitsuo; and Usui, Kazuto, to Yanmar Diesel Engine Co., Ltd. Construction of power transmitting device for internal combustion engine. 4,373,480, Cl. 123-195.00A.

Shimada, Fumio; and Sugiura, Yoji, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Electromagnetically driven shutter. 4,373,797, Cl. 354-234.000.

Shimizu, Tokuo, to Olympus Optical Co., Ltd. Flat motor. 4,374,336, Cl. 310-154.000.
Shimura, Kiichiro; Tamura, Takeo; Kido, Takayoshi; Hara, Hiroshi; and Tanaka, Morimasa, to Nissan Motor Company, Limited; and Ichiko Industries Limited. Wiper device. 4,374,348, Cl. 318-443.000.
Shinbo, Masafu: *See*—
Toda, Haruhiko; Higo, Moriaki; Saga, Hitoshi; and Shinbo, Masafu, 4,374,292, Cl. 585-360.000.
Shindelar, Aloysius C., to Deere & Company. Driples coupler. 4,373,551, Cl. 137-614.060.
Shingu, Hideo; Arai, Kozo; and Ootsuka, Ryotatsu, to Showa Aluminium Kabushiki Kaisha. Process of preparing aluminum of high purity. 4,373,950, Cl. 75-68.00R.
Shinshu Seiki Kabushiki Kaisha: *See*—
Arai, Kenichiro, 4,373,438, Cl. 101-93.040.
Mikoshiba, Hitoshi, 4,373,439, Cl. 101-93.090.
Shintani, Akira: *See*—
Nanba, Mitsuo; Ogirima, Masahiko; Kozuka, Hirotsugu; and Shintani, Akira, 4,373,975, Cl. 148-189.000.
Shippell, Joseph C., to Consolidated Packaging Corporation. Collapsible pallet mounted container. 4,373,637, Cl. 206-600.000.
Shiragaki, Sei: *See*—
Yamamoto, Yuji; and Shiragaki, Sei, 4,374,331, Cl. 307-291.000.
Shishido, Kunihiro: *See*—
Kishida, Nobuhiro; Shishido, Kunihiro; and Haryu, Satoshi, 4,373,891, Cl. 425-174.400.
Shoemaker, Arthur H., to Warner Lambert Technologies, Inc. Microscope objective. 4,373,785, Cl. 350-414.000.
Shoglow, Harry. Family baseball game. 4,373,724, Cl. 273-89.000.
Shogren, David K., to Xerox Corporation. Precession scanning system for copier device. 4,373,803, Cl. 355-49.000.
Shopsky, Harvey J., to RobertShaw Controls Company. Igniter structures and methods of making the same. 4,374,338, Cl. 313-142.000.
Showa Aluminium Kabushiki Kaisha: *See*—
Shingu, Hideo; Arai, Kozo; and Ootsuka, Ryotatsu, 4,373,950, Cl. 75-68.00R.
Shreve, James S. Automated exposure-contrast control index meter. 4,373,810, Cl. 356-226.000.
Shridharani, Ketan G.: *See*—
Tarrer, Arthur R.; and Shridharani, Ketan G., 4,374,016, Cl. 208-10.000.
Siemens Aktiengesellschaft: *See*—
Borburgh, Jacques; Naefe, Gerhard; and Rost, Helmut, 4,373,395, Cl. 73-607.000.
Heinzl, Joachim, 4,374,388, Cl. 346-140.00R.
Siemens Corporation: *See*—
Holesha, John, 4,374,308, Cl. 179-99.0LS.
Signetics Corporation: *See*—
Malwah, Manohar L., 4,373,250, Cl. 29-571.000.
Silberman, Raphael J.; Tilton, Frederick T.; Smith, Everett H.; and Wichkoski, Dennis A., to Baker International Corporation. Single trip tubing hanger assembly. 4,373,584, Cl. 166-117.700.
Silin, Askold A.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.
Silverman, Harold: *See*—
Foster, Dean H.; and Silverman, Harold, 4,373,711, Cl. 271-171.000.
Simon-Rosedowns Limited: *See*—
Alexander, David G.; and Woolley, Ian J., 4,373,434, Cl. 100-43.000.
Simunek, Frantisek: *See*—
Friese, Axel; and Simunek, Frantisek, 4,373,631, Cl. 206-438.000.
Singer Company, The: *See*—
Dunn, William H.; Garron, Stephen A.; Horey, Leonard I.; and Wurst, John W., 4,373,459, Cl. 112-158.00E.
Mallinson, Richard B., 4,373,805, Cl. 356-4.000.
Singh, Shobha: *See*—
Camlibel, Irfan; Singh, Shobha; and Van Uitert, LeGrand G., 4,374,391, Cl. 357-17.000.
Sivaramakrishnan, Parameswar, to Mobay Chemical Corporation. Polycarbonate having improved hydrolytic stability. 4,374,226, Cl. 524-399.000.
SK&F Lab Co.: *See*—
Graboyes, Harold; Kasper, Thomas J.; and Vaidya, Praful D., 4,374,252, Cl. 548-343.000.
Skalmierski, Bogdan; and Mroz, Krzysztof, to Politechnika Slaska im. Wincentego Pstrowskiego. Method of manufacture of sound box of stringed instruments, particularly violins. 4,373,980, Cl. 156-160.000.
Skeaff, James M.; Ritcey, Gordon M.; Haque, Kazi E.; and Lucas, Bernard H., to Canadian Patents & Development Limited. Uranium ore processing. 4,374,096, Cl. 423-9.000.
Skerka, Wolfgang: *See*—
Kundler, Walter; Pientak, Reinhold; Schulz, Claus; and Skerka, Wolfgang, 4,374,423, Cl. 364-434.000.
SKF (U.K.) Limited: *See*—
Greener, Brian; Pedder, Simon J.; and Forknall, John P., 4,373,759, Cl. 308-187.200.
Skok, Valentina M.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.
Slade, Louise: *See*—
Cole, Bruce A.; Levine, Harold I.; McGuire, Michael T.; Nelson, Kathleen J.; and Slade, Louise, 4,374,154, Cl. 426-565.000.
Lindstrom, Ted R.; and Slade, Louise, 4,374,151, Cl. 426-19.000.
Slish, Frank: *See*—
Faulring, Gloria M.; Fitzgibbon, Alan; and Slish, Frank, 4,373,948, Cl. 75-57.000.
Sloan, Albert H. Submersible hydraulic pump of the axially directed inlet and tangential outlet type. 4,373,860, Cl. 415-185.000.
Sloan, Thomas W.: *See*—
Yolton, Charles F.; Cloran, Thomas S.; and Sloan, Thomas W., 4,374,075, Cl. 264-8.000.
Smale, Charles H., to General Motors Corporation. Ceramic duct system for turbine engine. 4,373,326, Cl. 60-39.161.
Smigelski, Thomas S., to NCR Corporation. Suppression of parasitic sidewall transistors in locos structures. 4,373,965, Cl. 148-1.500.
Smith, David W.: *See*—
Hanson, Timothy A.; and Smith, David W., 4,373,887, Cl. 425-143.000.
Smith, Donald L. Venting system for oil or gas-fired appliances. 4,373,510, Cl. 126-307.00A.
Smith, Donald R.: *See*—
Clements, Philip R.; and Smith, Donald R., 4,373,606, Cl. 181-151.000.
Smith, Everett H.: *See*—
Silberman, Raphael J.; Tilton, Frederick T.; Smith, Everett H.; and Wichkoski, Dennis A., 4,373,584, Cl. 166-117.700.
Smith, Harvey A.; and Fleming, Joseph T., to United Technologies Corporation. Universal tail pipe connector. 4,373,377, Cl. 73-23.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,374,251, Cl. 548-309.000.
Smith, Marvin F., Jr. Reactionary human silhouette target. 4,373,733, Cl. 273-381.000.
Smith, Paul W. Method and apparatus for cutting and scoring folding container blanks. 4,373,929, Cl. 493-355.000.
Smith, Robert E.; and Gormley, Donald R., to United States of America, Navy. High pressure electrolytic oxygen generator. 4,374,014, Cl. 204-260.000.
Smith, Roy A.: *See*—
Scorey, Clive R.; and Smith, Roy A., 4,373,970, Cl. 148-11.50C.
Smith, Thomas M. Infra-red generator. 4,373,904, Cl. 431-328.000.
Smyth, Brice W., to Delorean Research Limited Partnership. Vacuum system for a moving production line. 4,373,885, Cl. 425-129.00R.
Snap-on Tools Corporation: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., 4,373,384, Cl. 73-119.00A.
Snelling, Christopher; and Lenhard, Myron J., to Xerox Corporation. Multi-mode electrostatographic printing machine. 4,373,799, Cl. 355-3.00R.
Sobajima, Katsunobu: *See*—
Inamoto, Hiroshi; Sobajima, Katsunobu; and Miyoshi, Shoichi, 4,373,826, Cl. 403-14.000.
Socha, Gregory E., to Dow Chemical Company, The. Readily dissolvable polysaccharide compositions. 4,373,959, Cl. 106-194.000.
Societe Alsacienne de Services Industriels: *See*—
Bajard, Jean, 4,373,374, Cl. 73-19.000.
Societe Anonyme de Recherches de Mecanique Appliquee: *See*—
Monteillet, Denis, 4,373,832, Cl. 403-374.000.
Societe Anonyme dite: Vallourec: *See*—
Mantelle, Jean; and Trouillet, Georges, 4,373,750, Cl. 285-55.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.): *See*—
Camboulives, Andre A. M. L.; Debeneix, Pierre; Gendronneau, Claude V. L.; and Hugnet, Roger P., 4,373,421, Cl. 184-6.400.
Sogo Pharmaceutical Co., Ltd.: *See*—
Osawa, Yasuko; and Uchikuga, Saburo, 4,374,247, Cl. 548-146.000.
Soini, Erkki; and Hemmila, Ilkka, to Wallac Oy. Fluorescence spectroscopy assay means with fluorescent chelate of a lanthanide. 4,374,120, Cl. 436-546.000.
Solartron Electronic Group Limited, The: *See*—
Ashford, David W.; and Hummel-Newell, Robert, 4,373,916, Cl. 434-22.000.
Solomon, James E.: *See*—
Khadder, Wadie N.; Wang, Jia-Tarng; and Solomon, James E., 4,373,253, Cl. 29-576.00B.
Somers, Edward V.; and Isenberg, Arnold O., to Westinghouse Electric Corp. Fuel cell generator and method of operating same. 4,374,184, Cl. 429-17.000.
Sonnenberg, Joseph, to Raychem Corporation. Imide flame retardants and compositions containing them. 4,374,220, Cl. 524-94.000.
Sonoco Products Company: *See*—
Horton, John D., 4,373,928, Cl. 493-103.000.
Sorensen, Jens O., to Trade Finance International. Thermal energy conversion system and method utilizing unencased expandites. 4,373,339, Cl. 60-649.000.
Soto, Eduardo R. R., to Tecnologia Argentina S.A. Mallet. 4,373,565, Cl. 145-36.000.
Souriau & Cie: *See*—
Raux, Jacques; and Benoist, Jacques, 4,373,770, Cl. 339-113.00R.
Southard, Carl: *See*—
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,373,211, Cl. 2-2.000.

Spaeth, Hans, to Maag Gear-Wheel & Machine Company Ltd. Gear measuring machine for inspecting helical gears. 4,373,268, Cl. 33-179.50R.

Spath, Thomas E.: *See*—
Criscuolo, James M., 4,373,517, Cl. 128-75.000.

Specht, Donald P.: *See*—
McGuckin, Hugh G.; Hartman, Susan E.; and Specht, Donald P., 4,374,194, Cl. 430-199.000.

Special Metals Corporation: *See*—
Asgar, Kamal; and Reichman, Steven H., 4,374,085, Cl. 420-470.000.

Sperry Corporation: *See*—
Viola, Raymond D.; and Hanley, Gerard L., 4,374,368, Cl. 333-128.000.

Sphere Investments Limited: *See*—
Schapper, Mark A., 4,373,638, Cl. 209-570.000.

Spiral Binding Company, Inc.: *See*—
Dawson, Kenneth H., 4,373,558, Cl. 140-71.00R.

Spivack, John D.; Dexter, Martin; and Pastor, Stephen D., to Ciba-Geigy Corporation. Alkanolamine ester of 1,1-biphenyl-2,2-diyl-and alkylidene-1,1-biphenyl-2,2-diyl-cyclic phosphites. 4,374,219, Cl. 524-91.000.

Sprague Electric Company: *See*—
Avery, Grant D., 4,374,333, Cl. 307-309.000.

Sprain, Charles E.: *See*—
Crews, Edgar W.; and Sprain, Charles E., 4,373,681, Cl. 242-25.00A.

Spruell, Jerry V.; and Lewis, Jennings B., III, to Union Carbide Corporation. Method for increasing vessel lining life for basic oxygen furnaces. 4,373,949, Cl. 75-60.000.

Stabilus GmbH: *See*—
Molders, Werner, 4,373,707, Cl. 267-64.120.

Stamp, Custis L., Jr.; Herzog, Rollie R.; and Brennan, Michael A., to Trane CAC, Inc. Control apparatus for an air conditioning system providing a plurality of energy-saving modes of operation. 4,373,351, Cl. 62-160.000.

Standard Oil Company, The: *See*—
Blum, Patricia R.; and Nicholas, Mark L., 4,374,043, Cl. 252-435.000.
Burrington, J. D.; Grasselli, R. K.; and Kartisek, C. T., 4,374,293, Cl. 585-410.000.

Standard Oil Company (Indiana): *See*—
Cox, Gordon F. N.; and Hsu, Feng H., 4,373,836, Cl. 405-217.000.

Stangeland, Maynard L., to Rockwell International Corporation. Multi-passage variable diffuser inlet. 4,373,919, Cl. 440-47.000.

Star Manufacturing Co.: *See*—
Kim, Kwon S., 4,373,312, Cl. 52-309.900.

Starck, William R., to A.M.S. Corporation. Resilient friction sash balance. 4,373,295, Cl. 49-435.000.

Stark, Terrence L., to General Motors Corporation. Diesel engine dual path exhaust cleaner and burner system. 4,373,330, Cl. 60-311.000.

Stecher, Friedhelm: *See*—
Morsbach, Martin; Stecher, Friedhelm; and Stocker, Eberhard, 4,373,735, Cl. 277-235.00B.

Steelcase Inc.: *See*—
Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,373,692, Cl. 248-162.100.

Steele, Carroll M.: *See*—
Crane, Hewitt D.; and Steele, Carroll M., 4,373,787, Cl. 351-210.000.

Steger, Philip J.: *See*—
Arnold, Jones B.; Steger, Philip J.; and Wright, Ralph R., 4,374,002, Cl. 204-7.000.

Steigerwald, Robert L.; and Park, John N., to General Electric Company. Electrically isolated battery charger for on-board electric vehicle applications. 4,374,355, Cl. 320-43.000.

Stein, Bernard; Keramaty, Hamid; and Brickus, Romas A., to Instrumentation Laboratory Inc. Cuvette assembly. 4,373,812, Cl. 356-246.000.

Steiner, Ulrich A.: *See*—
Berger, Mitchell H.; Maresca, Louis M.; and Steiner, Ulrich A., 4,374,239, Cl. 528-176.000.

Steinhilber, Gerhard: *See*—
Bitzer, Eberhard; Aichinger, Wilhelm; and Steinhilber, Gerhard, 4,374,006, Cl. 204-43.00G.

Steiniger, Wolfgang, to Hauni-Werke Korber & Co. KG. Method and apparatus for forming a stream from several types of tobacco. 4,373,538, Cl. 131-109.00R.

Stellman, Richard G.: *See*—
Trevino, Cesar A.; and Stellman, Richard G., 4,374,020, Cl. 208-216.00R.

Stenberg, Kaj O.; Traven, Lars J. C.; Losell, Ingvar F.; and Johnsson, Bo A., to Gambro Heart-Lung Products AB. Apparatus for the transfer of one or more substances between a gas and a liquid. 4,374,088, Cl. 422-46.000.

Stephan, James E.; Boduch, Paul A.; and Elverum, John A., to Coors Porcelain Company. Method for making cast epoxy resin bodies and epoxy formulation therefor. 4,374,076, Cl. 264-19.000.

Sterling Drug Inc.: *See*—
Dembinski, Joan R., 4,374,132, Cl. 424-241.000.
Jarcho, Michael, 4,374,124, Cl. 424-54.000.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,374,141, Cl. 424-266.000.
Philion, Richard E., 4,374,149, Cl. 424-330.000.

Stern, Roger A.: *See*—
Hill, Bruce C.; and Stern, Roger A., 4,373,532, Cl. 128-660.000.

Steuerwald, Alfred: *See*—
Baldwin, John J.; Ponticello, Gerald S.; Vickers, Stanley; and Steuerwald, Alfred, 4,374,140, Cl. 424-263.000.

Stewart, James A., to GTE Automatic Electric Laboratories, Inc. Power supply control circuit for subscriber carrier telephone system. 4,374,303, Cl. 179-2.0BC.

Stewart-Warner Corporation: *See*—
Ponczek, George M., 4,373,398, Cl. 73-738.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Resele, Peter; and Haslinger, Manfred, 4,373,741, Cl. 280-279.000.

Stillman, Lee E.; and Coughlin, Thomas G., to United States of America, Navy. Deployable support structure for spacecrafts. 4,373,690, Cl. 244-173.000.

Stocker, Eberhard: *See*—
Morsbach, Martin; Stecher, Friedhelm; and Stocker, Eberhard, 4,373,735, Cl. 277-235.00B.

Stoesz, James D.: *See*—
Errede, Louis A.; Stoesz, James D.; and Winter, George D., deceased, 4,373,519, Cl. 128-156.000.

Stone, Eugene M., to Penelizer Corporation. Process and composition for use in recycling of old asphalt pavements. 4,373,961, Cl. 106-281.00R.

Stone, Herman; Pauly, Peter D.; and Peolinsky, Michael P., Jr., to G.F.C. Foam Corporation. Intumescent flexible polyurethane foam. 4,374,207, Cl. 521-107.000.

Stone, James D.: *See*—
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,374,271, Cl. 564-310.000.

Stout, Christopher B.: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., 4,373,384, Cl. 73-119.00A.

Stratichuk, Joseph. In-ground trailer post assembly. 4,373,303, Cl. 52-40.000.

Strattan, John K.: *See*—
Roper, Charles R., Jr.; Strattan, John K.; Hetherington, Roy, Jr.; and Hiller, Austin J., 4,373,967, Cl. 148-2.000.

Stricklen, Phil M.; and Hogan, John P., to Phillips Petroleum Company. Small amounts of aluminum alkyl or dihydrocarbyl magnesium in slurry olefin polymerization. 4,374,234, Cl. 526-105.000.

Stricklin, Hazel R.; and Morrow, George W., Jr., to Daubert Industries, Inc. Composition and sheet materials for inhibiting corrosion of metals. 4,374,174, Cl. 428-341.000.

Stroz, John J.; and Mackay, Donald A. M., to Nabisco Brands, Inc. Method of reducing dental caries. 4,374,122, Cl. 424-48.000.

Strupczewski, Kenneth. Heating, ventilating and air conditioning system with reversible air flow. 4,373,576, Cl. 165-48.00R.

Stuchebnikov, Vladimir M.: *See*—
Beloglazov, Alexei V.; Beiden, Vladimir E.; Iordan, Georgy G.; Karneev, Vladimir M.; Papkov, Vladimir S.; Stuchebnikov, Vladimir M.; Khasikov, Viktor V.; and Surovikov, Mikhail V., 4,373,399, Cl. 73-777.000.

Stuermer, Walter L.: *See*—
Harding, Robert R.; and Stuermer, Walter L., 4,373,232, Cl. 17-11.000.

Stumbaugh, Leo F. Two wheel roller skate. 4,373,736, Cl. 280-11.230.

Sturtz, John P.: *See*—
Terhune, James H.; Sturtz, John P.; and Neissel, John P., 4,373,375, Cl. 73-19.000.

Stutz, Hansruedi, to Loepfe Brothers Limited. Equipment for continuously measuring the length of an endless material being wound up into a circular package. 4,373,266, Cl. 33-129.000.

Suda, Masashi; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Developing apparatus. 4,373,468, Cl. 118-658.000.

Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Dietzsch, Kurt, 4,373,665, Cl. 237-12.30A.

Sugitani, Masami: *See*—
Sakamoto, Yukio; Tanaka, Tetsuo; Kuboto, Masaaki; and Sugitani, Masami, 4,374,369, Cl. 333-182.000.

Sugiura, Yoji: *See*—
Shimada, Fumio; and Sugiura, Yoji, 4,373,797, Cl. 354-234.000.

Sugiyama, Matuyosi: *See*—
Morishita, Teru; Sugiyama, Matuyosi; Sato, Akira; and Suzuki, Toshikazu, 4,373,673, Cl. 239-703.000.

Sullivan, William A.: *See*—
Dahlgren, Harold P.; Sullivan, William A.; Gardiner, John W.; and Taylor, James E., 4,373,442, Cl. 101-207.000.

Sumitomo Electric Industries, Ltd.: *See*—
Saito, Nobuyuki; and Saito, Hiroshi, 4,374,377, Cl. 340-384.00E.

Sumitomo Metal Industries, Ltd.: *See*—
Tachimoto, Kazuo; and Tanoue, Toyosuke, 4,373,883, Cl. 425-8.000.

Sumitomo Metal Mining Co., Ltd.: *See*—
Iio, Toshimasa; and Ohkubo, Toyokazu, 4,374,098, Cl. 423-27.000.

Sumitomo Precision Products Co. Ltd.: *See*—
Nakamura, Masakazu, 4,373,243, Cl. 29-157.30D.

Summers, Stephen E.: *See*—
McGregor, Charles W.; and Summers, Stephen E., 4,374,221, Cl. 524-94.000.

Sunfilter S.r.l.: *See*—
Lancellotti, Enrico, 4,373,568, Cl. 160-184.000.

Sunset Ltd.: *See*—
Guibert, Raul, 4,374,319, Cl. 219-400.000.

Surovikov, Mikhail V.: *See*—
Beloglazov, Alexei V.; Beiden, Vladimir E.; Iordan, Georgy G.; Karneev, Vladimir M.; Papkov, Vladimir S.; Stuchebnikov,

Vladimir M.; Khasikov, Viktor V.; and Surovikov, Mikhail V., 4,373,399, Cl. 73-777.000.

Sutherland, George K.; and Thielen, Thomas J., to Sys-Tec, Inc. Instrument zeroing circuit. 4,374,362, Cl. 328-162.000.

Suzuki, Tadashi: *See*—
Kato, Shinichi; Tsuda, Hiroshi; Yamaki, Kiyoshi; Suzuki, Tadashi; and Kuwano, Fumiyoshi, 4,374,310, Cl. 200-61.540.

Suzuki, Toshikazu: *See*—
Morishita, Teru; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,373,672, Cl. 239-703.000.
Morishita, Teru; Sugiyama, Matuyosi; Sato, Akira; and Suzuki, Toshikazu, 4,373,673, Cl. 239-703.000.

Suzuki, Tsutai: *See*—
Yoshioka, Nobuyuki; Suzuki, Tsutai; Haba, Masanori; and Koyama, Hideo, 4,374,160, Cl. 427-101.000.

Svoboda, Josef, to TMC Corporation. Ski binding part. 4,373,742, Cl. 280-633.000.

Swanson, William C., to International Harvester Co. Hydraulic drive for an agricultural sprayer. 4,373,669, Cl. 239-124.000.

Swartz, William M., to Embosograph Display Mfg. Co. Advertising simulated neon sign display. 4,373,283, Cl. 40-564.000.

Sweet, Roger H.: *See*—
Douglas, Raymond J.; May, Herbert; Poznick, Jeffrey B.; and Sweet, Roger H., 4,373,289, Cl. 46-1.00R.

Swiss Aluminium Ltd.: *See*—
Schepers, Bernhard; Nobbe, Volker; Schroder, Bernd; Borer, Werner; and Kullack, Manfred, 4,374,119, Cl. 423-625.000.

Sybron Corporation: *See*—
Leiberich, Hermann, 4,373,699, Cl. 251-139.000.

Sys-Tec, Inc.: *See*—
Sutherland, George K.; and Thielen, Thomas J., 4,374,362, Cl. 328-162.000.

Szydlek, Nicholas P.: *See*—
Dorosz, Adolph S.; Kirwan, Patrick N.; and Szydlek, Nicholas P., 4,373,458, Cl. 112-121.120.

T. Y. Lin International: *See*—
Lin, Tung-Yen; and Chow, Philip Y., 4,373,837, Cl. 405-218.000.

Tachimoto, Kazuo; and Tanoue, Toyosuke, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Apparatus for producing granules from molten metallurgical slags. 4,373,883, Cl. 425-8.000.

Taira, Tadaaki; Ishihara, Toshio; and Takehara, Junichiro, to Nippon Kokan Kabushiki Kaisha. Up-set shrinker for producing thick wall steel pipe. 4,373,365, Cl. 72-52.000.

Takagi, Toshinori, to Futaba Denshi Kogyo Kabushiki Kaisha. Thin-film deposition. 4,374,162, Cl. 427-248.100.

Takahashi, Kunio: *See*—
Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, 4,374,284, Cl. 568-817.000.

Takahashi, Tatsuo, to RCA Corporation. Method for preparing divalent-europium-activated calcium sulfide phosphors. 4,374,037, Cl. 252-301.40S.

Takahashi, Yutaka: *See*—
Matsuura, Tsuyoshi; Fujiwara, Hiroshi; Aihara, Mamoru; Takahashi, Yutaka; and Nakajima, Yoshio, 4,373,796, Cl. 354-173.000.

Takai, Kazuki, to Clarion Co., Ltd. Tape player. 4,374,401, Cl. 360-96.500.

Takaishi, Naotake: *See*—
Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, 4,374,052, Cl. 252-522.00R.

Takamatsu, Toshiaki: *See*—
Nonomura, Keisaku; Takamatsu, Toshiaki; Uede, Hisashi; and Wada, Tomio, 4,373,784, Cl. 350-336.000.

Takaya, Sueji: *See*—
Negishi, Hideo; Goto, Kaoru; and Takaya, Sueji, 4,373,839, Cl. 408-59.000.

Takayama, Syuichi, to Olympus Optical Co., Ltd. Electronic flash apparatus. 4,374,345, Cl. 315-241.00P.

Takeda Chemical Industries, Ltd.: *See*—
Yamamoto, Masaki, 4,373,888, Cl. 425-149.000.

Takeda Riken Kogyo Kabushiki Kaisha: *See*—
Hirose, Masaaki, 4,374,358, Cl. 324-78.00D.

Takehara, Junichiro: *See*—
Taira, Tadaaki; Ishihara, Toshio; and Takehara, Junichiro, 4,373,365, Cl. 72-52.000.

Takekawa, Hiroshi, to Olympus Optical Company Limited. Method of measuring agglutinating reaction and a reaction vessel therefor. 4,373,931, Cl. 436-539.000.

Takeuchi, Kiyoshi: *See*—
Fujishiro, Takeshi; Takeuchi, Kiyoshi; and Kita, Toru, 4,373,378, Cl. 73-35.000.

Takizawa, Junichi; and Satoh, Nobuo, to Fuji Jukogyo Kabushiki Kaisha. Passive safety belt device. 4,373,747, Cl. 280-802.000.

Takusagawa, Takashi: *See*—
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,373,566, Cl. 152-353.00G.

Talamona, Enrico: *See*—
Gandini, Giovanni; and Talamona, Enrico, 4,373,884, Cl. 425-126.00R.

Talroze, Viktor L.: *See*—
Gorelik, Rudolf A.; Dukhovskoi, Evgeny A.; Kleiman, Alexandr M.; Kleimenov, Nikolai A.; Markevich, Andrei M.; Ponomarev, Ardalion N.; Silin, Askold A.; Skok, Valentina M.; Talroze, Viktor L.; Khomyakov, Anatoly V.; and Lyapunov, Andrei Y., 4,374,180, Cl. 428-421.000.

Tamura, Muneo. Method producing steam-like fumes for toy engine. 4,374,038, Cl. 252-305.000.

Tamura, Takeo: *See*—
Shimura, Kiichiro; Tamura, Takeo; Kido, Takayoshi; Hara, Hiroshi; and Tanaka, Morimasa, 4,374,348, Cl. 318-443.000.

Tamura, Yasuo: *See*—
Miyake, Kanichi; Tokuda, Masahiro; Aoki, Takaaki; Miyakawa, Hideaki; and Tamura, Yasuo, 4,374,217, Cl. 524-47.000.

Tamura, Yasuyuki: *See*—
Kuge, Tsukasa; Matsumoto, Toru; Watanabe, Tsuyoshi; and Tamura, Yasuyuki, 4,373,469, Cl. 118-652.000.

Tanaka, Koji, to Japan Exlan Co., Ltd. Novel water-swellable fibers and process for producing the same. 4,374,175, Cl. 428-369.000.

Tanaka, Kojiro: *See*—
Inami, Nobuo; and Tanaka, Kojiro, 4,374,332, Cl. 307-304.000.

Tanaka, Kyoji: *See*—
Nakaso, Yasuji; Tanaka, Kyoji; and Kawamoto, Hiromi, 4,374,108, Cl. 423-301.000.

Tanaka, Morimasa: *See*—
Shimura, Kiichiro; Tamura, Takeo; Kido, Takayoshi; Hara, Hiroshi; and Tanaka, Morimasa, 4,374,348, Cl. 318-443.000.

Tanaka, Taro; Sasaya, Hideaki; and Inagaki, Mitsuo, to Nippon Soken, Inc. Through-vane type rotary compressor with cylinder chamber of improved shape. 4,373,880, Cl. 418-150.000.

Tanaka, Tetsuo: *See*—
Sakamoto, Yukio; Tanaka, Tetsuo; Kuboto, Masaaki; and Sugitani, Masami, 4,374,369, Cl. 333-182.000.

Tandy Corporation: *See*—
Haagen, Peter H.; and Kline, Christopher R., 4,374,307, Cl. 179-84.00T.

Tanifuji, Shinya: *See*—
Tanimoto, Sunao; Tanifuji, Shinya; and Morooka, Yasuo, 4,373,364, Cl. 72-8.000.

Taniguchi, Nobuyuki; and Yuasa, Yoshio, to Minolta Camera Co., Ltd. Light measuring device for flash photography. 4,373,793, Cl. 354-31.000.

Taniguchi, Takashi; and Mibae, Jiro, to Toray Industries, Inc. Process for producing transparent shaped article having enhanced anti-reflective effect. 4,374,158, Cl. 427-41.000.

Tanimoto, Sunao; Tanifuji, Shinya; and Morooka, Yasuo, to Hitachi, Ltd. Method of controlling the temperature of a heating furnace. 4,373,364, Cl. 72-8.000.

Tanoue, Toyosuke: *See*—
Tachimoto, Kazuo; and Tanoue, Toyosuke, 4,373,883, Cl. 425-8.000.

Tao, John C. C., to Air Products and Chemicals, Inc. Method for producing upgraded products from a heavy oil feed. 4,374,018, Cl. 208-112.000.

Tarkett AB: *See*—
Bondoc, Alfredo A., 4,373,992, Cl. 162-145.000.

Tarrer, Arthur R.; and Shridharani, Ketan G., to Air Products and Chemicals, Inc. Process for hydrogenating coal and coal solvents. 4,374,016, Cl. 208-10.000.

Tatsumi, Aritaka, to Hitachi Cable, Ltd. Machine for forming spiral grooves in metal pipe inner surface. 4,373,366, Cl. 72-75.000.

Tay, Kay-Kiong, to Lord Corporation. Resilient sealing compositions. 4,374,218, Cl. 524-86.000.

Taylor, Glenn E. Tie butt handler. 4,373,856, Cl. 414-470.000.

Taylor, James E.: *See*—
Dahlgren, Harold P.; Sullivan, William A.; Gardiner, John W.; and Taylor, James E., 4,373,442, Cl. 101-207.000.

Taylor, Richard J.: *See*—
Igoe, Robert S.; and Taylor, Richard J., 4,374,155, Cl. 426-569.000.

Teche, Andre: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,374,257, Cl. 549-302.000.

Technische Hogeschool Eindhoven: *See*—
Vogten, Leonardus L. M.; and Willems, Leonardus F., 4,374,302, Cl. 179-1.0SM.

Tecnologia Argentina S.A.: *See*—
Soto, Eduardo R. R., 4,373,565, Cl. 145-36.000.

Teege, Gernot: *See*—
Horner, Michael; and Teege, Gernot, 4,374,258, Cl. 549-407.000.

Teepak, Inc.: *See*—
Wright, Norbert L.; and Selusnik, Jerome A., 4,373,648, Cl. 223-28.000.

Tekippe, Vincent J.; and Lach, Lawrence E., to Gould Inc. Photoluminescent indicator. 4,374,328, Cl. 250-458.100.

Teledyne Industries, Inc.: *See*—
Hanson, Timothy A.; and Smith, David W., 4,373,887, Cl. 425-143.000.
Petrovic, John E.; and Trenary, John, 4,374,354, Cl. 320-2.000.

Temple, Chester S.: *See*—
Hsu, Ed C.; Moore, L. Dow; and Temple, Chester S., 4,374,177, Cl. 428-392.000.

Temple, Victor A. K., to General Electric Company. High breakdown voltage semiconductor device. 4,374,389, Cl. 357-13.000.

Tennant Company: *See*—
Kimzey, Paul W.; and Frederick, Sherman B., 4,373,227, Cl. 15-347.000.

Tenneco Chemicals, Inc.: *See*—
Deinet, Adolph J.; and Woods, William B., 4,373,953, Cl. 106-16.000.
Goodman, Donald; Ceprini, Mario Q.; Hoch, Samuel; and Koral, Marvin, 4,374,057, Cl. 252-426.000.

Tenneco Inc.: *See—*
Martini, Alfred R. G., 4,373,329, Cl. 60-305.000.

Terhune, James H.; Sturtz, John P.; and Neissel, John P., to General Electric Company. Hydrogen sensor. 4,373,375, Cl. 73-19.000.

Teroson GmbH: *See—*
Schwarz, Herwig. J.; Burde, Hans-Jurgen H.; and Minet, Gunter, 4,374,172, Cl. 428-308.400.

Terumo Corporation: *See—*
Kobayashi, Susumu, 4,373,525, Cl. 128-214.00E.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,374,257, Cl. 549-302.000.

Tews, Richard R.: *See—*
Lilaonitkul, Amnuey; and Tews, Richard R., 4,373,529, Cl. 128-285.000.

Texaco Development Corporation: *See—*
McEntire, Edward E., 4,374,259, Cl. 549-518.000.

Texaco Inc.: *See—*
Cavitt, Stanley B., 4,374,260, Cl. 549-534.000.
Lin, Jiang-Jen; and Knifton, John F., 4,374,285, Cl. 568-902.000.

Texas Instruments Incorporated: *See—*
Herrmann, Carlo L.; and Ott, Granville E., 4,374,395, Cl. 358-22.000.
McElroy, David J., 4,373,248, Cl. 29-571.000.

Th. Goldschmidt AG: *See—*
Buttner, Gunter; Domazer, Hans-Gunter; and Eggert, Horst, 4,373,947, Cl. 75-0.5BB.

Thebert, Glenn W., to General Motors Corporation. Unison ring support system. 4,373,859, Cl. 415-159.000.

Thelen, Alfred J., to Optical Coating Laboratory, Inc. Non-polarizing thin film edge filter. 4,373,782, Cl. 350-166.000.

Thermal Engineering of Arizona, Inc.: *See—*
Kaufmann, Richard O., 4,373,572, Cl. 165-1.000.

Thielen, Thomas J.: *See—*
Sutherland, George K.; and Thielen, Thomas J., 4,374,362, Cl. 328-162.000.

Thiokol Corporation: *See—*
Bertozzi, Eugene R., 4,374,142, Cl. 424-270.000.
Gallagher, John P.; and Dougherty, Philip H., 4,374,211, Cl. 523-156.000.

Thomasscn & Drijver-Verblifa NV: *See—*
Heijting, Hendrik G., 4,373,368, Cl. 72-344.000.

Thompson, Hugh B.: *See—*
Washburn, William J.; Thompson, Hugh B.; and La Fever, Clifford E., 4,373,422, Cl. 89-33.0CA.

Thompson, Jerome A.: *See—*
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; Becker, Thomas P.; and Kaufman, Glenn A., 4,373,384, Cl. 73-119.00A.

Thompson, Thomas D.; Gergel, John F.; and Economou, Peter, to Yara Engineering Corporation. Stable clay slurries. 4,374,203, Cl. 501-148.000.

Thomson-CSF: *See—*
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, 4,373,774, Cl. 350-6.600.
Forterre, Gerard, 4,374,367, Cl. 333-24.100.
Lacombat, Michel; Pircher, Georges; and LeFevre, Herve, 4,373,814, Cl. 356-350.000.

Thorneburg, James L. Ski sock with integrally knit thickened fabric areas. 4,373,361, Cl. 66-178.00R.

Thorner, Benjamin C.: *See—*
Biller, Cleveland J.; and Thorner, Benjamin C., 4,373,853, Cl. 414-732.000.

Thubeauville, Heinz: *See—*
Mertens, Walter; Thubeauville, Heinz; and Glittenberg, Wilhelm, 4,373,244, Cl. 29-402.080.

Tiedemann, Herman H., to Chemetics International Ltd. Making calcium hypochlorite from impure lime. 4,374,115, Cl. 423-474.000.

Tielemans, Peter A. W.; and Jacobs, Cornelis A. J., to U.S. Philips Corporation. High-pressure sodium vapor discharge lamp. 4,374,339, Cl. 313-218.000.

Tilton, Frederick T.: *See—*
Silberman, Raphael J.; Tilton, Frederick T.; Smith, Everett H.; and Wichkoski, Dennis A., 4,373,584, Cl. 166-117.700.

Timbrook, Robert L. Golf club shaft and method of making the same. 4,374,315, Cl. 219-121.0LD.

Tipper, Derrick W., to Imperial Group Limited. Dynamic timing of rotating or reciprocating machine parts. 4,373,806, Cl. 356-23.000.

Tipton, Ann B.; and Crosby, Alan C., to Occidental Research Corporation. Process for reducing the hydrogen sulfide content in geothermal steam. 4,374,106, Cl. 423-231.000.

Titan Kogyo K.K.: *See—*
Uenishi, Toshiaki; Harada, Hidefumi; Sasaki, Katumasa; Akagi, Akio; and Yamasaki, Takanori, 4,373,963, Cl. 106-304.000.

Tkac, Frank S. Clock with selective visual alarm indicators. 4,373,822, Cl. 368-256.000.

TMC Corporation: *See—*
Svoboda, Josef, 4,373,742, Cl. 280-633.000.

Tobacco Machinery Co. of Ky. Inc.: *See—*
Jones, Thomas F., 4,373,323, Cl. 56-27.500.

Toda, Haruhiko; Higo, Moriaki; Saga, Hitoshi; and Shinbo, Masafu, to Lion Corporation. Process for preparing α-thujene. 4,374,292, Cl. 585-360.000.

Toellner, Robert L., to Halliburton Company. Apparatus and method for radio frequency heating of hydrocarbonaceous earth formations including an impedance matching technique. 4,373,581, Cl. 166-53.000.

Togo, Hiroshi: *See—*
Tsuchiya, Takuichi; and Togo, Hiroshi, 4,374,346, Cl. 315-276.000.

Tojza, Roman A.: *See—*
Hooker, Donald E.; and Tojza, Roman A., 4,373,727, Cl. 273-143.00R.

Tokuda, Masahiro: *See—*
Miyake, Kanichi; Tokuda, Masahiro; Aoki, Takaaki; Miyakawa, Hideaki; and Tamura, Yasuo, 4,374,217, Cl. 524-47.000.

Tokunaga, Kazuyoshi: *See—*
Mukoh, Akio; Morishita, Hirosada; Anzai, Masayasu; Tokunaga, Kazuyoshi; and Kikuchi, Yasuo, 4,374,191, Cl. 430-100.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hashimoto, Masaru, 4,374,356, Cl. 323-273.000.
Hashimoto, Shinichi, 4,373,714, Cl. 271-310.000.
Iinuma, Kazuhiro, 4,373,533, Cl. 128-663.000.

Tol-O-Matic, Inc.: *See—*
Garlapaty, Venkat R.; Hall, Michael J.; and Branham, William C., 4,373,427, Cl. 92-88.000.

Tomita, Takao; Yamamoto, Hitoshi; Enoki, Shigenaga; Goto, Isamu; and Hashimoto, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Power unit suspension system for motorcycles. 4,373,602, Cl. 180-227.000.

Tomy Kogyo Co., Inc.: *See—*
Kakizaki, Katsumi; and Kozuka, Michihiro, 4,373,293, Cl. 46-206.000.

Tone, Masatsugu: *See—*
Itatani, Hiroshi; Tone, Masatsugu; and Kurohara, Kazuaki, 4,373,597, Cl. 180-70.0MS.

Topliffe, Roger O., to United States of America, Army. Canard drive mechanism latch for guided projectile. 4,373,688, Cl. 244-3.240.

Toray Industries, Inc.: *See—*
Taniguchi, Takashi; and Mibae, Jiro, 4,374,158, Cl. 427-41.000.

Torborg, Ralph H., to Honeywell Inc. Open draft hood furnace control using induced draft blower and exhaust stack flow rate sensing. 4,373,897, Cl. 431-20.000.

Tosco Corporation: *See—*
Barney, John H., 4,374,017, Cl. 208-11.00R.

Toshin Seiko Kabushiki Kaisha: *See—*
Date, Takasaburo; Maki, Toshimichi; Iguchi, Mitsuya; Iwamaru, Sumifusa; and Watanabe, Hisashi, 4,373,911, Cl. 432-152.000.

Totai Co., Ltd.: *See—*
Mano, Tetsuro, 4,373,231, Cl. 17-1.00F.

Toyo Seikan Kaisha, Ltd.: *See—*
Kishida, Nobuhiro; Shishido, Kunihiro; and Haryu, Satoshi, 4,373,891, Cl. 425-174.400.

Toyoda, Kazuhiro: *See—*
Ono, Chikai; and Toyoda, Kazuhiro, 4,374,431, Cl. 365-174.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Morishita, Teru; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,373,672, Cl. 239-703.000.
Morishita, Teru; Sugiyama, Matuyosi; Sato, Akira; and Suzuki, Toshikazu, 4,373,673, Cl. 239-703.000.

Trade Finance International: *See—*
Sorensen, Jens O., 4,373,339, Cl. 60-649.000.

Trane CAC, Inc.: *See—*
Sawyer, George N., 4,373,354, Cl. 62-238.600.
Stamp, Custis L., Jr.; Herzog, Rollie R.; and Brennan, Michael A., 4,373,351, Cl. 62-160.000.

Traven, Lars J. C.: *See—*
Stenberg, Kaj O.; Traven, Lars J. C.; Losell, Ingvar F.; and Johnsson, Bo A., 4,374,088, Cl. 422-46.000.

Traxler, Peter, to Ciba-Geigy Corporation. Antibiotically active aminopapulacandin derivatives. 4,374,129, Cl. 424-180.000.

Treheux, Michel: *See—*
Gouronnec, Alain; Regreny, Andre; and Treheux, Michel, 4,373,943, Cl. 65-10.100.

Trenary, John: *See—*
Petrovic, John E.; and Trenary, John, 4,374,354, Cl. 320-2.000.

Trenbeath, Steven L.; Novak, Robert W.; and Feldman, Allan M., to American Cyanamid Company. Method for drying isocyanic acid. 4,374,107, Cl. 423-265.000.

Treutelaar, Edward J. Helmet mounted constant tension traction device. 4,373,523, Cl. 128-207.180.

Trevino, Cesar A.; and Stellman, Richard G., to Shell Oil Company. Catalytic hydroconversion process with catalyst retainer. 4,374,020, Cl. 208-216.00R.

Triba, James T.: *See—*
Goodman, Robert B.; and Triba, James T., 4,373,544, Cl. 137-220.000.

Trico Products Incorporated: *See—*
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,373,211, Cl. 2-2.000.

Tricon, Alfred J. Supportive angle holding means and structure clamping means for storage devices. 4,373,639, Cl. 211-86.000.

Trocciola, John C.: *See—*
Powers, Joseph; Trocciola, John C.; and Martin, Ronald G., 4,374,185, Cl. 429-36.000.

Trouillet, Georges: *See—*
Mantelle, Jean; and Trouillet, Georges, 4,373,750, Cl. 285-55.000.

Trowbridge, Robert H., Jr.: *See—*
Lombardi, John P.; Hult, Tore M.; and Trowbridge, Robert H., Jr., 4,373,720, Cl. 273-29.00A.

Tsigdinos, George A.: *See*—
Sebenik, Roger F.; Hallada, Calvin J.; Barry, Henry F.; and Tsigdinos, George A., 4,374,100, Cl. 423-56.000.
Tsuchiya, Takuichi; and Togo, Hiroshi, to Nippon Electric Co., Ltd. Voltage detection circuits for a-c power supplies. 4,374,346, Cl. 315-276.000.
Tsuda, Hiroshi: *See*—
Kato, Shinichi; Tsuda, Hiroshi; Yamaki, Kiyoshi; Suzuki, Tadashi; and Kuwano, Fumiyoshi, 4,374,310, Cl. 200-61.540.
Tsukada, Shusei; and Kurosaki, Yasuhide, to Canon Kabushiki Kaisha. Developing device with shutter blade. 4,373,798, Cl. 355-3.0DD.
Tsutsumi, Masato, to Maui Land & Pineapple Company, Inc. Top and butt trimmer for pineapples. 4,373,432, Cl. 99-542.000.
Tuong, Duc L.: *See*—
Bienvenu, Jacques; Carre, Claude; Tuong, Duc L.; and Verdier, Henri, 4,374,409, Cl. 364-200.000.
Turner, Clarence C.: *See*—
Crawford, John P., 4,373,831, Cl. 403-318.000.
Tusinski, Joseph; and Hill, Phillip D., to Coburn Optical Industries, Inc. Automatic edge beveller for removing the sharp peripheral edges of ophthalmic lenses. 4,373,298, Cl. 51-105.0LG.
Tustin, Gerald C.: *See*—
Larkins, Thomas H.; Polichnowski, Stanley W.; Tustin, Gerald C.; and Young, David A., 4,374,070, Cl. 260-549.000.
Tuttrup, Gene J. Drum apparatus. 4,373,419, Cl. 84-411.00R.
Tyke, Charles R.: *See*—
Wolters, Richard H.; Anderson, William C.; Tyke, Charles R.; and Schreiner, Charles P., 4,373,642, Cl. 220-72.000.
Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez; and Bowman, Edward, 4,373,348, Cl. 62-115.000.
Tyree, Lewis, Jr.; and Fischer, Harry C. Ice-making and water-heating. 4,373,345, Cl. 62-79.000.
Tyszkiewicz, Theodore J.: *See*—
Boden, Richard M.; and Tyszkiewicz, Theodore J., 4,374,276, Cl. 568-398.000.
Uchikuga, Saburo: *See*—
Osawa, Yasuko; and Uchikuga, Saburo, 4,374,247, Cl. 548-146.000.
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, to Sato Technical Research Laboratory Ltd.; and Itoh Metal Abrasive Co., Ltd. Process for producing fibers with a specially fixed size from melts. 4,374,074, Cl. 264-8.000.
Uede, Hisashi: *See*—
Nonomura, Keisaku; Takamatsu, Toshiaki; Uede, Hisashi; and Wada, Tomio, 4,373,784, Cl. 350-336.000.
Uenishi, Toshiaki; Harada, Hidefumi; Sasaki, Katumasa; Akagi, Akio; and Yamasaki, Takanori, to Titan Kogyo K.K. Lustrous pigment and process for producing same. 4,373,963, Cl. 106-304.000.
Ueno, Takashi: *See*—
Kawano, Yoshihiko; Adachi, Hirosi; Watanuki, Masakazu; and Ueno, Takashi, 4,373,679, Cl. 241-275.000.
Ulin, Roy A.; Foley, Ted; and Shah, Hasmukh, to Akzona Incorporated. Used surgical sharps container with re-usable magnetic base. 4,373,629, Cl. 206-350.000.
Ulrich, Bohdan, to Hasler AG Bern. Electrical connector. 4,373,764, Cl. 339-75.0MP.
UMC Industries, Inc.: *See*—
Gilliom, John W., 4,374,318, Cl. 219-400.000.
Kilwin, Thomas C., 4,373,923, Cl. 464-36.000.
Ungarean, Gary L.: *See*—
Yarwood, John C.; Gaule, Gerhart K.; and Ungarean, Gary L., 4,373,571, Cl. 164-467.000.
Union Carbide Corporation: *See*—
Atkins, Kenneth E., 4,374,215, Cl. 523-514.000.
Ausikaitis, Joseph P.; and Garg, Desh R., 4,373,935, Cl. 55-33.000.
Berger, Mitchell H.; Mayer, Walter P.; and Ward, Robert J., 4,374,237, Cl. 528-28.000.
Berger, Mitchell H.; Maresca, Louis M.; and Steiner, Ulrich A., 4,374,239, Cl. 528-176.000.
Bryant, David R.; and Galley, Richard A., 4,374,278, Cl. 568-454.000.
Faulring, Gloria M.; Fitzgibbon, Alan; and Slish, Frank, 4,373,948, Cl. 75-57.000.
Fuderer, Andrija, 4,374,022, Cl. 208-310.00Z.
Kulkarni, Ravindra D.; and Goodard, Errol D., 4,374,178, Cl. 428-404.000.
Michie, William J., Jr., 4,374,227, Cl. 524-528.000.
Pelton, John F., 4,373,704, Cl. 266-225.000.
Spruell, Jerry V.; and Lewis, Jennings B., III, 4,373,949, Cl. 75-60.000.
Union Special Corporation: *See*—
Parker, William R.; and Gosche, Matt J., 4,373,460, Cl. 112-162.000.
Uniscrew Limited: *See*—
Zimmern, Bernard, 4,373,866, Cl. 417-53.000.
United States Borax & Chemical Corporation: *See*—
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,374,271, Cl. 564-310.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See*—
Deadmore, Daniel L.; and Young, Stanley G., 4,374,183, Cl. 428-641.000.
Agriculture: *See*—
Biller, Cleveland J.; and Thorner, Benjamin C., 4,373,853, Cl. 414-732.000.
Air Force: *See*—
Goronkin, Herbert, 4,373,255, Cl. 29-580.000.
Army: *See*—
Christe, Karl O.; and Wilson, William W., 4,374,112, Cl. 423-351.000.
Drzewiecki, Tadeusz M., 4,373,553, Cl. 137-840.000.
Orlando, Michael D.; and Riley, Jean M., 4,374,201, Cl. 435-239.000.
Pell, Kynric M.; and Conard, Robert G., 4,373,808, Cl. 356-152.000.
Reiss, Edward H., Jr., 4,374,091, Cl. 422-114.000.
Rothwarf, Frederick, 4,373,977, Cl. 156-51.000.
Topliffe, Roger O., 4,373,688, Cl. 244-3.240.
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McCarter, Robert J., 4,374,171, Cl. 428-288.000.
Energy: *See*—
Arnold, Jones B.; Steger, Philip J.; and Wright, Ralph R., 4,374,002, Cl. 204-7.000.
Campbell, Gene K., 4,373,867, Cl. 417-90.000.
Pitrolo, Augustine A.; Mei, Joseph S.; and Shang, Jerry Y., 4,373,454, Cl. 110-347.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Mattauch, Robert J.; and Seabaugh, Alan C. Controlled in situ etch-back. 4,373,989, Cl. 156-635.000.
National Aeronautics and Space Administration: *See*—
Lee, Robert D., 4,374,378, Cl. 340-566.000.
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Adolph, Horst G., 4,374,241, Cl. 528-266.000.
Desai, Jaydev D., 4,374,086, Cl. 420-507.000.
Heller, Carl A.; and Murbach, Warren J., 4,374,189, Cl. 430-2.000.
Kim, Oh-Kil; and Fox, Robert B., 4,374,048, Cl. 252-500.000.
McCartney, Joseph F.; Jones, Thomas E.; and Johnson, Leopold J., 4,374,186, Cl. 429-154.000.
Smith, Robert E.; and Gormley, Donald R., 4,374,014, Cl. 204-260.000.
Stillman, Lee E.; and Coughlin, Thomas G., 4,373,690, Cl. 244-173.000.
Wattenbarger, J. Frank, 4,373,521, Cl. 128-202.130.
U.S. Philips Corporation: *See*—
Asselman, George A. A.; and Michels, Albertus P. J., 4,373,343, Cl. 62-238.600.
Bakker, Gijsbertus; and Groot, Theodorus C., 4,373,237, Cl. 445-3.000.
Bodart, Robert; and Werts, Jean-Pierre, 4,374,305, Cl. 179-16.0EA.
Bouwknegt, Albert; and Lauwerijssen, Petrus C., 4,374,340, Cl. 313-220.000.
Hemery, Jacques; and Roger, Bernard P., 4,374,364, Cl. 330-298.000.
Lux, Peter W., 4,374,419, Cl. 364-414.000.
Tielemans, Peter A. W.; and Jacobs, Cornelis A. J., 4,374,339, Cl. 313-218.000.
Van Rosmalen, Gerard E.; and Opheij, Willem G., 4,374,324, Cl. 250-201.000.
Wilting, Hermanus J. H., 4,373,251, Cl. 29-571.000.
United Technologies Corporation: *See*—
Ferris, Donald L.; and Ogle, Peter C., 4,373,862, Cl. 416-61.000.
Goodman, Robert B.; and Triba, James T., 4,373,544, Cl. 137-220.000.
Jones, Robert A., 4,373,328, Cl. 60-226.200.
Lach, Richard F.; and Calcasola, Richard W., 4,374,435, Cl. 370-13.000.
Powers, Joseph; Trocciola, John C.; and Martin, Ronald G., 4,374,185, Cl. 429-36.000.
Smith, Harvey A.; and Fleming, Joseph T., 4,373,377, Cl. 73-23.000.
Unitika Limited: *See*—
Kudo, Kazuhige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,374,031, Cl. 252-8.800.
UOP Inc.: *See*—
Antos, George J., 4,374,046, Cl. 252-466.00B.
Frame, Robert R., 4,374,042, Cl. 252-412.000.
Gryskiewicz, Gregory A.; and Koehler, Raymond A., 4,374,169, Cl. 428-221.000.
Imai, Tamotsu; and Homeier, Edwin H., 4,374,287, Cl. 568-909.000.
Schmidt, Robert J., 4,374,286, Cl. 568-907.000.
Upjohn Company, The: *See*—
Ewen, James H.; McClellan, Thomas R.; McMillin, Michael H.; and Murray, Pat L., 4,374,210, Cl. 521-159.000.
Upton, Jenny, personal representative: *See*—
Errede, Louis A.; Stoesz, James D.; and Winter, George D., deceased, 4,373,519, Cl. 128-156.000.
Urban, Edward J.: *See*—
Beasley, John K.; and Urban, Edward J., 4,374,224, Cl. 524-298.000.
USAC Electronic Industrial Co., Ltd.: *See*—
Sakai, Toshihiro; and Kuhara, Tetsuji, 4,374,410, Cl. 364-200.000.
Ushimura, Shoji, to Nissan Motor Company, Limited. Exhaust gas recirculation system for internal combustion engine. 4,373,498, Cl. 123-571.000.
USM Corporation: *See*—
Dorosz, Adolph S.; Kirwan, Patrick N.; and Szydlek, Nicholas P., 4,373,458, Cl. 112-121.120.
Powderley, John; and Brookes, David J., 4,373,318, Cl. 53-540.000.
Usui, Kazuto: *See*—
Shikata, Mitsuo; and Usui, Kazuto, 4,373,480, Cl. 123-195.00A.

Utida, Masayoshi: *See*—
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v.Eckardstein, Karl-Ernst; Fiala, Werner; and Schwing, Friedrich, to Friedrich Wilh. Schwing, GmbH. Piping valve with a housing for the transfer of a wiper insertable in conduits that supply pressurized viscous material, preferably concrete. 4,373,225, Cl. 15-104.06A.
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Van Dewoestine, Robert V., to Corning Glass Works. Wood burning stove. 4,373,452, Cl. 110-203.000.
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Walton, Russell C. Machine control device. 4,374,309, Cl. 200-61.420.
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Watanabe, Kazuki. Machine for use in implanting plant supporting stakes. 4,373,833, Cl. 405-36.000.
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Watson, Herman, to Respitrace Corporation. Method and apparatus for calibrating respiration monitoring system. 4,373,534, Cl. 128-725.000.
Wattenbarger, J. Frank, to United States of America, Navy. Heated breathing bag sheath. 4,373,521, Cl. 128-202.130.
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Webster, Douglas G., to Veeco/Macronetics Inc. AC Induction motor braking system. 4,374,352, Cl. 318-762.000.
Weed, Lyle E., to Brunswick Corporation. Outboard propulsion gear-case. 4,373,922, Cl. 440-89.000.
Weeks, Thomas J., Jr.: *See*—
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West, Cecil W., to Coal Industry (Patents) Limited. Vehicle brake equipment. 4,373,613, Cl. 188-43.000.
West, John C., to Century Mfg. Co. Light blocking lens for welder helmet. 4,373,212, Cl. 2-8.000.
Westerfield, Lawerence D., to International Harvester Co. Agricultural furrow forming apparatus depth control. 4,373,456, Cl. 111-88.000.
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March, Edward J.; and Newman, Raymond J., 4,373,658, Cl. 228-242.000.
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Westernacher, Helmut; and Aertken, Karl, to GAF-Huls Chemie GmbH. Distillation of butinediol-1,4. 4,373,999, Cl. 203-6.000.
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Whitt, Everett D. Surgical limb holder. 4,373,709, Cl. 269-328.000.
Whittaker, Ralph E., to Atlantic Richfield Company. Housing structure utilizing solar energy. 4,373,308, Cl. 52-173.00R.
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Wick, Alexander E., to Hoffmann-La Roche Inc. 1-Ethyl-1,4-dihydro-6-(2-naphthyl)-4-oxo-nicotinic acid and esters thereof. 4,374,261, Cl. 560-51.000.
Wicki, Heinz, to Sandoz Ltd. Metal complexes of disazo compounds having a 5-amino or hydroxy-3-carboxy or methyl-1- substituted phenylpyrazole coupling component radical. 4,374,064, Cl. 260-147.000.
Widmann, Wolfgang, to Daimler-Benz A.G. Turbocharged internal combustion engine with spark ignition. 4,373,337, Cl. 60-611.000.
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Wm. G. Leininger Knitting Company: *See*—
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Williams, Donald L., to General Motors Corporation. Engine cooling-passenger heating system. 4,373,666, Cl. 237-12.30B.
Williams Electronics, Inc.: *See*—
Ritchie, Steven S., 4,373,725, Cl. 273-121.00A.
Williams, Errol R., Jr.: *See*—
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Wojtowicz, Wesley J., to H. A. Montgomery Co., Inc., The. Metal-working lubrication. 4,374,168, Cl. 428-212.000.
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Workman Bag Company Ltd.: *See*—
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Wragg, Robert, to Hughes Aircraft Company. Thin-panel illuminator for front-lit displays. 4,373,282, Cl. 40-546.000.

Wright, Danny W., to Pennwalt Corporation. Chlorocarbon and halogen recovery from vent gas stream. 4,373,942, Cl. 62-12.000.

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Wykes, John S.; and Adsley, Ian, to Coal Industry (Patents) Limited. Method for determining the proportion of at least one material in a moving mixture of materials. 4,374,326, Cl. 250-255.000.

Wytko, Richard, to Weyerhaeuser Company. Container. 4,373,660, Cl. 279-39.00R.

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Yamada, Hirosuke, to Kawasaki Steel Corporation. Method and apparatus for separating slag and pouring molten steel out of a container such as a converter or the like. 4,373,705, Cl. 266-227.000.

Yamada, Tateo: *See*—
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Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Photographic objective of reduced size. 4,373,786, Cl. 350-432.000.

Yamagata, Toshio: *See*—
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Yamaguchi, Hiroshi, to Nissan Motor Company, Limited. Spark timing control system. 4,373,489, Cl. 123-422.000.

Yamaguchi, Kazuyuki: *See*—
Masuda, Teruo; Morita, Masayasu; Yamaguchi, Kazuyuki; and Harada, Yoshikazu, 4,373,516, Cl. 128-57.000.

Yamaki, Kiyoshi: *See*—
Kato, Shinichi; Tsuda, Hiroshi; Yamaki, Kiyoshi; Suzuki, Tadashi; and Kuwano, Fumiyoshi, 4,374,310, Cl. 200-61.540.

Yamamoto, Hiroshi; and Furutani, Yoshikazu, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Method and device for analysis with color identification test paper. 4,373,818, Cl. 356-408.000.

Yamamoto, Hitoshi: *See*—
Tomita, Takao; Yamamoto, Hitoshi; Enoki, Shigenaga; Goto, Isamu; and Hashimoto, Takeshi, 4,373,602, Cl. 180-227.000.

Yamamoto, Masaki, to Takeda Chemical Industries, Ltd. Apparatus for mass-producing medical tablets. 4,373,888, Cl. 425-149.000.

Yamamoto, Shigeo: *See*—
Kudo, Kazushige; Yamamoto, Shigeo; and Murase, Shigemitsu, 4,374,031, Cl. 252-8.800.

Yamamoto, Shinichi; and Ito, Toshihiko, to Nippon Soken, Inc. Extrusion die and method for producing extrusion die for forming a honeycomb structure. 4,373,895, Cl. 425-461.000.

Yamamoto, Toshio: *See*—
Yuge, Shizuo; Kitou, Nobuo; Yamamoto, Toshio; and Kanesaka, Michiru, 4,373,802, Cl. 355-14.0FU.

Yamamoto, Yuji; and Shiragaki, Sei, to Yamatake-Honeywell Co., Ltd. D-Type flip-flop circuit. 4,374,331, Cl. 307-291.000.

Yamane, Tsuneo: *See*—
Komurasaki, Satoshi; and Yamane, Tsuneo, 4,373,487, Cl. 123-418.000.

Yamasaki, Takanori: *See*—
Uenishi, Toshiaki; Harada, Hidefumi; Sataki, Katumasa; Akagi, Akio; and Yamasaki, Takanori, 4,373,963, Cl. 106-304.000.

Yamashita, Akira; and Hiroyuki, Nagai, to Matsushita Electric Industrial Co., Ltd. Multiplexed television audio signal receiver. 4,374,398, Cl. 358-143.000.

Yamatake-Honeywell Co., Ltd.: *See*—
Yamamoto, Yuji; and Shiragaki, Sei, 4,374,331, Cl. 307-291.000.

Yamazaki, Noboru: *See*—
Yuasa, Teruo; Yamazaki, Noboru; and Morimoto, Yoshio, 4,374,272, Cl. 564-315.000.

Yanmar Diesel Engine Co., Ltd.: *See*—
Shikata, Mitsuo; and Usui, Kazuto, 4,373,480, Cl. 123-195.00A.

Yano, Singo: *See*—
Shibata, Shoji; Kumagai, Akira; Harada, Masatoshi; Yano, Singo; Saito, Hiroshi; and Takahashi, Kunio, 4,374,284, Cl. 568-817.000.

Yano, Yasuhiro: *See*—
Eida, Tsuyoshi; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Ohta, Tokuya, 4,373,954, Cl. 106-20.000.

Yara Engineering Corporation: *See*—
Thompson, Thomas D.; Gergel, John F.; and Economou, Peter, 4,374,203, Cl. 501-148.000.

Yarwood, John C.; Gaule, Gerhart K.; and Ungarean, Gary L., to Olin Corporation. Apparatus and process for electromagnetically shaping a molten material within a narrow containment zone. 4,373,571, Cl. 164-467.000.

Yasuda, Takashi: *See*—
Ueda, Setsuo; Yasuda, Takashi; Yamada, Tokuyoshi; and Kobayashi, Shigeki, 4,374,074, Cl. 264-8.000.

Yates, Barrie J.; and Hurst, Ronald C., to Cabot Corporation. Production of high surface area carbon blacks. 4,374,113, Cl. 423-445.000.

Yelich, William, to Cla-Val Co. Valve having a bias-mounted elastomeric sealing element, and method of constructing the same. 4,373,550, Cl. 137-516.290.

Yolton, Charles F.; Cloran, Thomas S.; and Sloan, Thomas W., to Crucible Inc. Method for the plasma-arc production of metal powder. 4,374,075, Cl. 264-8.000.

Yoshida, Takao: *See*—
Luccarelli, Domenick, Jr.; and Yoshida, Takao, 4,374,123, Cl. 424-49.000.

Yoshimura, Hirofumi: *See*—
Sawatani, Tadashi; Ishii, Mitsuo; and Yoshimura, Hirofumi, 4,373,971, Cl. 148-12.0EA.

Yoshioka, Nobuyuki; Suzuki, Tsutai; Haba, Masanori; and Koyama, Hideo, to Kabushiki Kaisha Meidensha. Method of making a non-linear voltage-dependent resistor. 4,374,160, Cl. 427-101.000.

Yoshizaki, Osamu; and Inai, Masayuki, to Konishiroku Photo Industry Co., Ltd. Method of forming gradated images by thermal printer and thermal head for thermal printers. 4,374,385, Cl. 346-1.100.

Young, David A.: *See*—
Larkins, Thomas H.; Polichnowski, Stanley W.; Tustin, Gerald C.; and Young, David A., 4,374,070, Cl. 260-549.000.

Young, Robert F.: *See*—
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., 4,373,920, Cl. 440-59.000.
Hall, Charles B.; McBride, Edward D.; and Young, Robert F., 4,373,921, Cl. 440-61.000.

Young, Stanley G.: *See*—
Deadmore, Daniel L.; and Young, Stanley G., 4,374,183, Cl. 428-641.000.

Yuasa, Hitoshi; and Imai, Hirosuke, to Nippon Oil Company, Ltd. Polyhexamethylenimine and process for its preparation. 4,374,243, Cl. 528-422.000.

Yuasa, Teruo; Yamazaki, Noboru; and Morimoto, Yoshio, to Mitsui Toatsu Chemicals, Inc. Process for preparing 2-(4'-hydroxyaryl)-2-(4'-aminoaryl)-propanes. 4,374,272, Cl. 564-315.000.

Yuasa, Yoshio: *See*—
Taniguchi, Nobuyuki; and Yuasa, Yoshio, 4,373,793, Cl. 354-31.000.

Yuge, Shizuo; Kitou, Nobuo; Yamamoto, Toshio; and Kanesaka, Michiru, to Minolta Camera Co., Ltd. Pre-operative time display system for copying machines. 4,373,802, Cl. 355-14.0FU.

Zabielski, Ray F. Looseleaf page lifter. 4,373,825, Cl. 402-80.00L.

Zahnradfabrik Friedrichshafen, AG: *See*—
Elser, Dieter, 4,373,598, Cl. 180-143.000.
Walter, Wolfgang; and Breitweg, Werner, 4,373,599, Cl. 180-148.000.

Zahnradfabrik Friedrichshafen A.G.: *See*—
Ehrlinger, Friedrich; and Meyerle, Michael, 4,373,359, Cl. 74-687.000.

Zenith Radio Corporation: *See*—
Citta, Richard W.; and Falater, Scott L., 4,374,437, Cl. 455-164.000.
Ensinger, James W., 4,374,399, Cl. 358-147.000.

Zeuna-Staerker GmbH & Co. KG: *See*—
Santiago, Andres; and Santiago, Enrique, 4,373,331, Cl. 60-323.000.

Zicko, James A., to Container Corporation of America. Dispensing container. 4,373,687, Cl. 242-163.000.

Zien, Allen S., to Zien Mechanical Contractors. Emergency fresh air supply device. 4,373,522, Cl. 128-206.120.

Zien Mechanical Contractors: *See*—
Zien, Allen S., 4,373,522, Cl. 128-206.120.

Zimmer, Inc.: *See*—
Kaiser, William L.; and Brown, Gale R., 4,373,518, Cl. 128-92.0EB.

Zimmern, Bernard, to Uniscrew Limited. Process to control the delivery of a single screw compressor. 4,373,866, Cl. 417-53.000.

Zipper, Donald H.: *See*—
Banich, John N., Sr.; and Zipper, Donald H., 4,373,641, Cl. 215-331.000.
Zlotek, T. F., to Dana Corporation. Elastomeric energizer for sprag clutch. 4,373,620, Cl. 192-41.00A.
Znaiden, Alexander P., to Avon Products, Inc. Elastomers and process for their preparation. 4,374,236, Cl. 528-26.500.
Zucker, Jerry; and Porlier, Beth W., to RM Industrial Products Company, Inc. Ceramic fiber foam and method for making same. 4,374,202, Cl. 501-82.000.
Zwick, Eugene B.; Nguyen, Dung D.; Brigham, William D.; and Hoffman, Kenneth. Burner construction. 4,373,896, Cl. 431-9.000.
Zwigert, John M.: *See*—
Rodenbaugh, Ralph L.; and Zwigert, John M., 4,373,437, Cl. 101-35.000.
110707 Canada Ltee: *See*—
Grandmont, Robert, 4,373,473, Cl. 122-20.00B.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF FEBRUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Caddell, Richard W., to Kearney & Trecker Corporation. Mass memory access method and apparatus. Re. 31,153, Cl. 365-230.000.

Coulter Electronics, Inc.: *See*—
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., Re. 31,149, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., Re. 31,150, Cl. 422-64.000.

Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., to Coulter Electronics, Inc. Apparatus for monitoring chemical reactions and employing moving photometer means. Re. 31,149, Cl. 422-64.000.

Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., to Coulter Electronics, Inc. Apparatus for monitoring chemical reactions and employing moving photometer means. Re. 31,150, Cl. 422-64.000.

Horne, Thomas: *See*—
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., Re. 31,149, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., Re. 31,150, Cl. 422-64.000.

Iwasaki, Hikoji: *See*—
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, Re. 31,152, Cl. 340-388.000.

Kearney & Trecker Corporation: *See*—
Caddell, Richard W., Re. 31,153, Cl. 365-230.000.

King, William J. Inexpensive solar cell and method therefor. Re. 31,151, Cl. 136-256.000.

Kobishi Electric Co., Ltd.: *See*—
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, Re. 31,152, Cl. 340-388.000.

Kreiselman, Robert L.: *See*—
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., Re. 31,149, Cl. 422-64.000.
Ginsberg, Guenter; Horne, Thomas; and Kreiselman, Robert L., Re. 31,150, Cl. 422-64.000.

Mayo, John H. Sub-sea equipment test and isolation tool. Re. 31,148, Cl. 73-40.50R.

Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, to Kobishi Electric Co., Ltd. Alarm buzzer. Re. 31,152, Cl. 340-388.000.

Shimoya, Shigeo: *See*—
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, Re. 31,152, Cl. 340-388.000.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 267,942, Cl. D13-23.000.

Alwell, Anne T.; Fogarty, A. Edward; Fogarty, Bonnie R.; Pagani, David A.; and Pook, Peter D., to Leisure Dynamics, Inc. Game device. 267,963, 2-15-83, Cl. D21-168.000.

Amerace Corporation: *See*—
Luckinbill, Harold R., 267,933, Cl. D10-113.000.

American Hospital Supply Corporation: *See*—
Nilles, John D.; Stankiewicz, Stanley L.; and Zubriski, David S., 267,974, Cl. D24-12.000.

Amerock Corporation: *See*—
Pittenger, Teresa R. B., 267,926, Cl. D8-318.000.

Associated Press, The: *See*—
Helling, Bernd; Zarro, Michael S.; and Rutherford, David G., 267,947, Cl. D14-94.000.

Ault, Charles M., to Termiflex Corporation. Front panel for a keyboard and display unit. 267,950, 2-15-83, Cl. D14-115.000.

Australasian Training Aids (Pty.) Ltd.: *See*—
Meredith, Brian H., 267,967, Cl. D22-99.000.

Ballereaud, Pierre. Stick for the application of cosmetics. 267,984, 2-15-83, Cl. D28-89.000.

Bannwart, Rene: *See*—
Schwab, Jean-Claude; and Bannwart, Rene, 267,931, Cl. D10-39.000.

Batts, John H.; and Duester, Everett L., to John Thomas Batts, Inc. Garment hanger body. 267,920, 2-15-83, Cl. D6-254.000.

Batts, John H., to John Thomas Batts, Inc. Garment hanger. 267,921, 2-15-83, Cl. D6-254.000.

Baxter Travenol Laboratories, Inc.: *See*—
van Amerongen, Edward; Cammarata, Frank, III; and Virag, Robert A., 267,975, Cl. D24-62.000.

Beach, Earl; and Matle, Calvin, to Ross Operating Valve Company. Muffler for a valve. 267,968, 2-15-83, Cl. D23-1.000.

Bendix Corporation, The: *See*—
Vintzel, Constantine; and McDaniel, George H., 267,944, Cl. D13-35.000.

Berner, John M. Powered snow thrower. 267,953, 2-15-83, Cl. D15-12.000.

Bianchi, William T. Packaging container. 267,928, 2-15-83, Cl. D9-329.000.

Bjon, Matts V. Random number die. 267,961, 2-15-83, Cl. D21-41.000.

Cammarata, Frank, III: *See*—
van Amerongen, Edward; Cammarata, Frank, III; and Virag, Robert A., 267,975, Cl. D24-62.000.

Cheung, Kwok K., to Cheung, Kwok Kee; Tong, King Sing; and Tong, Wing Kui. Vanity mirror incorporating illuminated surround. 267,983, 2-15-83, Cl. D28-67.000.

Cheung, Kwok Kee: *See*—
Cheung, Kwok K., 267,983, Cl. D28-67.000.

Cheung, Kwok T. Holder for letters, writing instruments, note pad and other stationery articles. 267,959, 2-15-83, Cl. D19-78.000.

Claman, Mike T., to Lewittes Furniture Enterprises, Inc. Chair. 267,913, 2-15-83, Cl. D6-78.000.

Clarion Co. Ltd.: *See*—
Hisatsune, Toshiyuki, 267,949, Cl. D14-96.000.

Clemente, Roger. Electric fan for engine cooling. 267,973, 2-15-83, Cl. D23-158.000.

Compagnie Generale des Etablissements Michelin: *See*—
Grenie, Philippe, 267,938, Cl. D12-147.000.

Conroy, John R.; and Mayne, Russell A. Motor vehicle trailer. 267,937, 2-15-83, Cl. D12-102.000.

Corba, Robert E., to S. C. Johnson & Son, Inc. Child-safe actuator for pressurized container. 267,930, 2-15-83, Cl. D9-448.000.

Corum, Ries, Bannwart & Co.: *See*—
Schwab, Jean-Claude; and Bannwart, Rene, 267,931, Cl. D10-39.000.

Drozd, Otto, to Wollard Aircraft Equipment, Inc. Passenger conveyance loader for airports. 267,977, 2-15-83, Cl. D25-1.000.

Ducellier & CIE: *See*—
Mauroy, Bernard, 267,979, Cl. D26-28.000.

Duester, Everett L.: *See*—
Batts, John H.; and Duester, Everett L., 267,920, Cl. D6-254.000.

Dushey, Phillip. Animal trap. 267,966, 2-15-83, Cl. D22-18.000.

Duvoux, Pierre G., to Equipements Automobiles Marchal. Windshield wiper. 267,939, 2-15-83, Cl. D12-155.000.

Duvoux, Pierre G., to Equipements Automobiles Marchal. Windshield wiper. 267,940, 2-15-83, Cl. D12-155.000.

Equipements Automobiles Marchal: *See*—
Duvoux, Pierre G., 267,939, Cl. D12-155.000.
Duvoux, Pierre G., 267,940, Cl. D12-155.000.

Erlewine, Mark; and Gibbons, William F. Guitar. 267,956, 2-15-83, Cl. D17-14.000.

Etudes Realisations de Chaines Automatiques: *See*—
Torterotot, Roland, 267,929, Cl. D9-370.000.

Faldmo, Adaire M.; and Faldmo, Robert. Pistol cabinet. 267,917, 2-15-83, Cl. D6-181.000.

Faldmo, Robert: *See*—
Faldmo, Adaire M.; and Faldmo, Robert, 267,917, Cl. D6-181.000.

Fildan, Gerhard. Link for brassieres. 267,909, 2-15-83, Cl. D2-409.000.

FMC Corporation: *See*—
Robinett, Frederick A.; and Shook, James M., 267,935, Cl. D12-13.000.

Fogarty, A. Edward: *See*—
Alwell, Anne T.; Fogarty, A. Edward; Fogarty, Bonnie R.; Pagani, David A.; and Pook, Peter D., 267,963, Cl. D21-168.000.

Fogarty, Bonnie R.: *See*—
Alwell, Anne T.; Fogarty, A. Edward; Fogarty, Bonnie R.; Pagani, David A.; and Pook, Peter D., 267,963, Cl. D21-168.000.

Fuji Koeki Corporation: *See*—
Sawara, Kenji, 267,954, Cl. D16-6.000.

Gibbons, Margaret K. Rabbit figure. 267,964, 2-15-83, Cl. D21-187.000.

Gibbons, William F.: *See*—
Erlewine, Mark; and Gibbons, William F., 267,956, Cl. D17-14.000.
Gibstein, Edward; and Nortman, Jeffrey, to Jedco Products Ltd. Combination utility and pocketbook light. 267,980, 2-15-83, Cl. D26-37.000.
Gordon Ellis and Company: *See*—
Rodger, Michael, 267,969, Cl. D23-71.000.
Grenie, Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 267,938, 2-15-83, Cl. D12-147.000.
Gronwick, Jerry P., to Sunbeam Corporation. Radiant heater. 267,970, 2-15-83, Cl. D23-120.000.
Hammer, Claire W.; and Wernig, Clara Z. Arm-sling. 267,976, 2-15-83, Cl. D24-64.000.
Harrison, Marc, to Quartzpower, Inc. Heater. 267,971, 2-15-83, Cl. D23-123.000.
Haruguchi, Kenichi; Miyake, Takao; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 267,923, 2-15-83, Cl. D7-351.000.
Heap, Jean W., to Pendelfin Studios Limited. Dragon sculpture. 267,934, 2-15-83, Cl. D11-162.000.
Helling, Bernd; Zarro, Michael S.; and Rutherford, David G., to Associated Press, The. Portable facsimile transmitter. 267,947, 2-15-83, Cl. D14-94.000.
Hisatsune, Toshiyuki, to Clarion Co. Ltd. Amplifier for automobile. 267,949, 2-15-83, Cl. D14-96.000.
Houts, Ronald C.: *See*—
Seim, William J.; and Houts, Ronald C., 267,943, Cl. D13-24.000.
Huber, Otto L., to Moldex/Metric Products, Inc. Disposable face mask. 267,985, 2-15-83, Cl. D29-08.000.
Innovative Concepts, Inc.: *See*—
Long, Jerry M.; and Womack, James A., 267,911, Cl. D3-35.000.
Ishida, Katsuhiro: *See*—
Kosako, Mikio; and Ishida, Katsuhiro, 267,946, Cl. D14-94.000.
Jackson, Frank W. Electrocardiogram analyzer. 267,957, 2-15-83, Cl. D18-9.000.
Jannell & Son Body Company: *See*—
Jannell, Walter D.; McIntosh, Howard N.; and O'Bar, Edward J., 267,936, Cl. D12-96.000.
Jannell, Walter D.; McIntosh, Howard N.; and O'Bar, Edward J., to Jannell & Son Body Company. Vehicular van body. 267,936, 2-15-83, Cl. D12-96.000.
Jedco Products Ltd.: *See*—
Gibstein, Edward; and Nortman, Jeffrey, 267,980, Cl. D26-37.000.
John Thomas Batts, Inc.: *See*—
Batts, John H.; and Duester, Everett L., 267,920, Cl. D6-254.000.
Batts, John H., 267,921, Cl. D6-254.000.
Kato, Takaharu, to Ricoh Company, Ltd. Single lens reflex camera. 267,955, 2-15-83, Cl. D16-8.000.
Kennedy, Donald J. Pocket dispenser for perfume and the like. 267,982, 2-15-83, Cl. D28-5.000.
Kobayashi, Masashi, to Maruman Golf Kabushiki Kaisha. Iron club head. 267,965, 2-15-83, Cl. D21-220.000.
Kojima, Fumiyo; and Yoshihama, Manzo, to Ricoh Company, Ltd. Facsimile transmitter and receiver. 267,948, 2-15-83, Cl. D14-94.000.
Kosako, Mikio; and Ishida, Katsuhiro, to Sharp Corporation. Facsimile transceiver. 267,946, 2-15-83, Cl. D14-94.000.
La Mancusa, Martin R. Combined bottle opener and can opener. 267,925, 2-15-83, Cl. D8-18.000.
Lasher, George D. Paper baling rack. 267,918, 2-15-83, Cl. D6-184.000.
Leisure Dynamics, Inc.: *See*—
Alwell, Anne T.; Fogarty, A. Edward; Fogarty, Bonnie R.; Pagani, David A.; and Pook, Peter D., 267,963, Cl. D21-168.000.
Lenger, Sidney A., Jr., to Singer Company, The. Mirrored hutch or similar article. 267,915, 2-15-83, Cl. D6-153.000.
Lenger, Sidney A., Jr., to Singer Company, The. Chest of drawers or similar article. 267,916, 2-15-83, Cl. D6-154.000.
Lewittes Furniture Enterprises, Inc.: *See*—
Claman, Mike T., 267,913, Cl. D6-78.000.
Lin, Richard A. Rack for holding stemware glasses. 267,914, 2-15-83, Cl. D6-113.000.
Lingwall, David K.: *See*—
Schockemoehl, Robert J.; and Lingwall, David K., 267,972, Cl. D23-128.000.
Lomauro, Carl. Stuffed food product. 267,908, 2-15-83, Cl. D1-2.000.
Lombard, Charles W. Automotive wheel. 267,941, 2-15-83, Cl. D12-209.000.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Diskette storage container. 267,911, 2-15-83, Cl. D3-35.000.
Luckinbill, Harold R., to Amerace Corporation. Roadway marker. 267,933, 2-15-83, Cl. D10-113.000.
Martin, James W. Low-profile intake manifold. 267,952, 2-15-83, Cl. D15-5.000.
Maruman Golf Kabushiki Kaisha: *See*—
Kobayashi, Masashi, 267,965, Cl. D21-220.000.
Matle, Calvin: *See*—
Beach, Earl; and Matle, Calvin, 267,968, Cl. D23-1.000.
Mauroy, Bernard, to Ducellier & CIE. Lamp for a vehicle. 267,979, 2-15-83, Cl. D26-28.000.
Mayne, Russell A.: *See*—
Conroy, John R.; and Mayne, Russell A., 267,937, Cl. D12-102.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Heat-sink for electronic semiconductor devices. 267,942, 2-15-83, Cl. D13-23.000.
McDaniel, George H.: *See*—
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McIntosh, Howard N.: *See*—
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Meredith, Brian H., to Australasian Training Aids (Pty.) Ltd. Light duty target mechanism. 267,967, 2-15-83, Cl. D22-99.000.
Miller, Jack V. Fluorescent circular lamp adapter. 267,978, 2-15-83, Cl. D26-26.000.
Minnesota Mining and Manufacturing Company: *See*—
Seim, William J.; and Houts, Ronald C., 267,943, Cl. D13-24.000.
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Moldex/Metric Products, Inc.: *See*—
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Montague, Fred W., Jr. Electric candlestick or the like. 267,981, 2-15-83, Cl. D26-96.000.
Moore, John S. Game board. 267,960, 2-15-83, Cl. D21-15.000.
Nilles, John D.; Stankiewicz, Stanley L.; and Zubriski, David S., to American Hospital Supply Corporation. Dental handpiece motor. 267,974, 2-15-83, Cl. D24-12.000.
Nippon Interphone Co. Ltd.: *See*—
Sawaya, Osamu, 267,945, Cl. D14-54.000.
Nortman, Jeffrey: *See*—
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O'Bar, Edward J.: *See*—
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Pagani, David A.: *See*—
Alwell, Anne T.; Fogarty, A. Edward; Fogarty, Bonnie R.; Pagani, David A.; and Pook, Peter D., 267,963, Cl. D21-168.000.
Pendelfin Studios Limited: *See*—
Heap, Jean W., 267,934, Cl. D11-162.000.
Pittenger, Teresa R. B., to Amerock Corporation. Pull. 267,926, 2-15-83, Cl. D8-318.000.
Pook, Peter D.: *See*—
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Rhoades, Benjamin A. Fireplace tool holder. 267,924, 2-15-83, Cl. D23-138.200.
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ISSUED FEBRUARY 15, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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